

A. G. A. Convention Opens Oct. 12 at Atlantic City

Sept.
1931

AMERICAN GAS ASSOCIATION MONTHLY

Convention Program to Center on Prosecution
of Five-Year Program

Widening the Network
of Gas Mains

WILLIAM J. WELSH

Surmounting Competition In Domestic
Field

HALL M. HENRY

Johns Hopkins Course
Proves Aid to Gas
Industry

Hot Water Heater
Show at New Orleans

Manufacturers To March on Detroit for
Annual Meeting, September 17-18





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Us
Down
for 24,"

said Cedar Rapids

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said Baltimore



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AMERICAN GAS ASSOCIATION MONTHLY

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Clarence V. Roberts
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OUR OWN WHO'S WHO

CLARENCE V. ROBERTS, president of the Roberts & Mander Stove Co., Philadelphia, since it was founded in 1903, has been associated with the stove foundry business since 1865, when as a small boy he was much interested in "core making" in the foundry of his father, Thomas and Roberts, later succeeded by Thomas, Roberts, Stevenson Company. During this period the wood burning "Nine Plate Stove" gave way successively to the coal burning "Step Stove," "Flat Top," "Brick Set Range," "Portable Range," and "Gas Range" which was first shown commercially at the Centennial Exposition in Philadelphia in 1876. At the time when Dr. Walton Clark (of the United Gas Improvement Co.) was president of the Franklin Institute, Philadelphia, Mr. Roberts was instrumental in having erected there a bronze tablet which shows in outline this invention and is inscribed as follows: "Commemorative of Benjamin Franklin's Invention of the Pennsylvania Fireplace 1742. Erected by the Stove Manufacturing Industry of the United States 1917."

It seems quite fitting that Philadelphia should thus recognize among its other "first" achievements Benjamin Franklin's experiments in producing the "Pennsylvania Fireplace" which is described in a small pamphlet issued at that time.

Mr. Roberts was the organizer and first president of the Manufacturers' Section of the National Commercial Gas Association, and in 1915 was one of its directors. In 1910, Mr. Roberts and several others founded the Highland Gas Company, in Bucks County, Pa., and was its president until it was absorbed by the Allentown-Bethlehem Gas Company.

AMERICAN GAS ASSOCIATION MONTHLY

VOLUME XIII

SEPTEMBER, 1931

NUMBER 9

Convention Program To Center on Prosecution Of Five-Year Program

PRACTICAL application of the Five-Year Program of Association Activities, approved in May by the Executive Board, and which becomes effective with the new Association year, will be outlined by speakers at the Thirteenth Annual Convention and Exhibition of the American Gas Association. All A. G. A. officials are agreed that the prosecution of fundamental policies, to meet present day conditions, as outlined by the Committee on Association Activities, is of the utmost importance.

Interpretation of the new Five-Year Plan is expected to form the major part of the president's address, which will be delivered by Clifford E. Paige at the first general session, Tuesday morning, October 13.

Particular emphasis has been placed on that part of the program which



*Sir Francis
Goodenough*

deals with limiting the scope of the Association's work to those objects which are of first importance and greatest practical value to the gas industry. D. D. Barnum, president of the Consolidated Gas Company, Boston, Mass., who served as chairman of the Committee on Association Activities, pointed out in the Committee's report to the Advisory Council and Executive Board that if the Association's activities are broadened beyond the scope of practical accomplishment, its influence would be weakened.

As usual one of the most conspicuous features of the Convention and Exhibition will be the contribution of the manufacturer company members who will assemble for the information of all members and guests a display of appliances and apparatus used in the gas industry that will fill the main hall of the Atlantic City Auditorium, the largest building of its kind in the world. Thirteen years ago a small hotel ballroom was adequate to stage the first A. G. A. Exhibition. This year a comprehensive array of exhibits promises to present the largest, most important and best diversified display of appliances and equipment in the history of the industry.

Referring to the more than 200 displays which will occupy space in the convention hall, Mr. Paige said: "This entire exhibit represents the



Atlantic City Auditorium, Atlantic City, N. J., to be scene of A. G. A. Convention for third consecutive year—October 12-16.



C. W. Paige,
President

R. W. Gallagher,
Vice-President



N. C. McGowen,
Vice-President



faith that our manufacturer members in the future of the gas industry. They have backed this faith with a large expenditure of their money and brains, at a time when almost everyone has felt the results of the depression in business and sales.

"We, too, have faith in our business and its future. Those who have the responsibility of directing to any degree the operations of our utilities know that our industry is deep-rooted in the very foundations of the business and economic structure of this country."

The exhibition will be thrown open at 10 o'clock Monday morning, October 12, and will continue until the Convention ends at noon, Friday, October 16.

Atlantic City, N. J., will be host to the A. G. A. members for the third consecutive year. Evidently the Atlantic City Auditorium was built for the use of the American Gas Association, for everywhere may be seen the initials A. C. A., the C looking more like a G.

During the general sessions, which start on Tuesday and continue through Thursday, prominent speakers from within and without the gas industry will present papers on salesmanship, natural gas developments, research, dealer relations, the Association program and allied topics.

Sir Francis Goodenough, C. B. E., of London, executive chairman of the British Commercial Gas Association, will discuss the growing significance

and dignity of commerce in the life of the world in our time, coupled with adequate education for salesmanship. Sir Francis is chairman of the British Government Committee on Education

and Salesmanship, and is in an especially strong position to discuss this topic since the committee has just completed a three-year study in Great Britain, and he will give the A. G. A. members the benefit of his experience. Parts



J. Herbert Canning

of the report have been incorporated in lectures at both Oxford and Cambridge Universities.

Another international note will be struck at the Convention when J. Herbert Canning, O. B. E., of New-

port, Monmouthshire, president of the Institution of Gas Engineers, will bring a message from the industry in Great Britain to the industry in America. Mr. Canning is one of the outstanding men in the engineering branches of the industry in England.

Colonel Oscar H. Fogg, vice-president of the Consolidated Gas Company of New York, New York, a former president of the American Gas Association will be another of the principal speakers at the general sessions and will talk on certain phases of dealer cooperation.

Recognized authorities will speak of the outstanding natural gas problems of today from both the economic and financial viewpoints.

Relations of the gas industry to the home will be discussed by Mrs. William Brown Meloney, editor of the *New York Herald-Tribune*, Sunday Magazine.

Morse Dell Plain, president of the Northern Indiana Public Service Company, Hammond, Indiana, will make an address to sales plans and the economics of sales planning.

B. C. Forbes, well-known editor of the magazine which bears his name, and authority on business and financial information, will be among the prominent speakers from outside the gas industry. He will devote his attention to utility securities and utility relations.

Research as a necessity in modern business will be ably discussed. There will be reports from the more important Association general committees, which will be, as usual, submitted

William S. Welsh,
Treasurer



Arthur Hewitt,
Vice-President



Alexander Forward,
Managing Director



at the general sessions by their chairmen. William J. Welsh, treasurer, will submit his annual resume of Association finances.

Departmental and sectional meetings will get an early start this year. The Natural Gas Department, Manufacturers Section, Publicity and Advertising Section, Home Service Roundtable and the Accounting Section are scheduled to hold meetings on the opening day—Monday.

Interesting programs which will embrace topical subjects will be presented at each of these meetings. The Publicity and Advertising Section, among other things, plans to devote much of its discussion to the subject of the use of radio broadcasting for the benefit of local gas companies. Plans for this now are being worked by D. M. Mackie, chairman of the section. Other speakers will submit papers on other phases of advertising as it affects the industry.

Methods and machines used in customers' accounting, office management, customer relations and general accounting will be the high spots to be covered at the three sessions planned by the Accounting Section.

On Tuesday, besides the first general session, there will be meetings of the Technical, Commercial and Accounting Sections. Besides the discussion of other subjects, the Technical Section plans to concentrate its program on presentations which will outline the problems of the large distribution centers in connection with the changeover to natural and mixed gases.

E. R. Acker, chairman of the Commercial Section, announces that speakers before his section will include Hugh H. Cuthrell, manager of the new business department, The Brooklyn Union Gas Company, Brooklyn, N. Y.; Samuel R. Lewis, of Chicago; H. C. Davidson, secretary of the Consolidated Gas Company, of New York; Hall M. Henry, Utility Management Corporation, New York, N. Y., and others. Mr. Cuthrell will speak on problems presented today by dealer cooperation; Mr. Lewis's subject will be "What's Ahead in the House Heating Field"; Mr. Davidson has accepted an invitation to present some facts about merchandising ac-

counting, while Mr. Henry will submit a paper dealing with competition in the domestic cooking and water heating fields.

Gas Refrigeration and what the industry should do with it, as well as an analysis on the importance of the full commercial development of business from all angles, also will be presented before the Commercial Section by recognized authorities.

The Commercial Section will hold a second session on Wednesday, and the initial meeting of the Industrial Gas Section also will take place on that day, to be followed by a second meeting on Thursday. D. W. Chapman, chairman of the Industrial Section, announces his program as follows:

INDUSTRIAL GAS SECTION

Wednesday, October 14, 1931

Address of the Chairman.

D. W. Chapman, Manager, Industrial Gas Sales, The Peoples Gas Light & Coke Company, Chicago, Illinois.

Report of the Nominating Committee.

Chas. C. Krausse, Ass't Manager, Fuel Sales, Consolidated Gas Electric & Power Company, Baltimore, Maryland.

Election.

Industrial Gas Research and its Relation to Gas Sales.

N. T. Sellman, Consolidated Gas Company of N. Y., New York, N. Y.

The Fuel Problem as the Manufacturer Sees It.

J. M. Watson, Hupp Motor Car Corporation.

Economic & Industrial Forces That Affect the Sale of Gas in Manufacturing Plant.

H. O. Loebell, Vice-President, Combustion Utilities Corporation, New York, N. Y.

Thursday, October 15

Sales Problems of the Natural Gas Industrial Salesman.

F. B. Jones, Director, Industrial Gas Sales, Equitable Gas Company, Pittsburgh, Pennsylvania.

Industrial Gas From the View Point of Management.

T. V. Purcell, Vice-President, Peoples Gas Light & Coke Company, Chicago, Illinois.

Getting Our Story to the Executives in Industry.

W. D. McJunkin, McJunkin Advertising Company, Chicago, Illinois.

Following is the tentative schedule of business meetings:

Monday—October 12

10:00 A.M. Exhibition opens

10:30 A.M. Accounting Section

10:30 A.M. Manufacturers Section
2:00 P.M. Natural Gas Department
2:00 P.M. Accounting Section
2:30 P.M. Publicity and Advertising Section

Tuesday—October 13

10:00 A.M. General Session
2:00 P.M. Accounting Section
2:00 P.M. Commercial Section
2:00 P.M. Technical Section

Wednesday, October 14, 1931

10:00 A.M. General Session
2:00 P.M. Industrial Gas Section
2:00 P.M. Commercial Section

Thursday—October 15

10:00 A.M. General Session
2:00 P.M. Technical Section
2:00 P.M. Industrial Gas Section
2:00 P.M. Accounting Section.

Columbia Offers Courses in Fuel Technology

COLUMBIA UNIVERSITY has issued a circular describing new graduate courses in fuel technology which are being offered in the University Extension, Department of Chemical Engineering.

Some of the features which are expected to make the course of special interest to gas engineers are as follows:

Recent developments in theories of combustion as applied to the gas producer, the blue gas generator, and the utilization of gas.

Critical study of heat and material balances with drill in calculations as applied to various methods of gas production and utilization.

Theory of coal carbonization and developments in its application.

Utilization of oils in the gas industry including blue gas carburetion, reforming processes, liquefied petroleum gases.

Discussion of theories and calculations on condensation, scrubbing, heat exchange and purification.

Columbia Gas Course Popular Abroad

W. E. THOMANN, of Manila, Philippine Islands, has enrolled in the Columbia University Home Study course in Manufactured Gas and is sending in lessons regularly.

The Home Study Department of Columbia hears at somewhat less regular intervals from George Maleki of Warsaw, Poland, who is an interesting student.



Atlantic City Country Club where A. G. A. members may enjoy golf

Artistic Entertainment Features On Convention Program

ECHOES of last year's American Gas Association convention entertainment excellence are still heard throughout the industry. Although the 1930 entertainment features are conceded by all to have been the most successful and thoroughly enjoyable ever attempted, the committee in charge of the arrangements for this year's convention has completed plans that should make the 1931 program even more artistic.

It is around the convention orchestra that the continuity of the entertainment program must be built. This year's convention will feature Phil Spitalny's famous orchestra of 27 men, direct from the Edgewater Beach Hotel, Chicago, where they held sway, captivating the dancing and music-loving people of Chicago.

The selection of this orchestra involved the consideration on the part of the committee not only of their high degree of ability and popularity as a dance orchestra, but also the broad and nationally acclaimed experience of their conductor as a concert maestro.

Phil Spitalny, a graduate of the Imperial Conservatory of Music, of Odessa, Russia, began his musical career when he conducted, at the age

As Told by A. H. Thorne, Chairman, Entertainment Committee, to C. W. Berg-horn, Secretary

of nine, his father's concert orchestra. Sixteen years ago he came to America where his first work was with an Italian band and orchestra. He rose from this modest beginning through brilliant effort in concert, dance, theater and radio work to his present high standing as a director of music.

His orchestra is well and favorably known to America's vast radio audi-

ence and dance enthusiasts, having been engaged at some of the country's largest hotels.

Always popular with audiences of all kinds is male voice singing. This year the American Gas Association delegates will hear, for the first time under such auspices, the Mendelssohn Glee Club, of New York, under the direction of Ralph L. Baldwin. This famous singing organization, listing among its members names well-known in the realms of art, music and society, gave its first concerts in New York during the winter of 1866-7. During the 60-odd years of its existence the Glee Club has never before been guest of a national convention such as ours, all of their concerts being private or presented under private or charitable auspices, and our industry can well be complimented at having so distinguished an organization of artists appear before its convention. The Glee Club was founded and directed by Joseph Mosenthal, one of the premier musicians of his day in New York and under his direction a high level of artistic accomplishment was reached. His successors, Arthur D. Woodruff, Edward MacDowell, Frank Damrosch, Louis Koemmenisch,



Phil Spitalny



Ralph L. Baldwin

and Ralph L. Baldwin, the present conductor, have maintained that standard and today experts agree that the sonorously rich musical tone of the club is unequalled by that of any similar organization in the world.

Another outstanding feature of the



Lew White

Entertainment Program

Tuesday Night, October 13

President's Reception, followed by dancing. Music by Phil Spitalny's Orchestra.

Wednesday Afternoon, October 14

Ladies' Luncheon, Seaview Golf Club. Music by Spitalny's Orchestra.

Busses will leave the Traymore Hotel at noon, returning at conclusion of afternoon's function.

Wednesday Night, October 14

Concert, featuring:

Hallie Stiles, soprano

Mendelssohn Glee Club

Phil Spitalny's Orchestra

Lew White, organist.

Presentation of medals and awards.

A portion of this program will be broad-

cast over a national network through courtesy of Halsey Stuart & Company and the National Broadcasting Company.

Dancing until 1:00 A.M.

Thursday Night, October 15

"A Night in Hawaii," featuring the South Sea Islanders and Phil Spitalny's Orchestra. Dancing until 1:00 A.M.

All of the Seaview Golf Club's facilities will be available to the Association's guests, including golf from Monday, October 12 to Friday, October 16, inclusive, as well as card playing, tennis and putting greens.

Arrangements have also been made with the Atlantic City Country Club for A. G. A. members to enjoy golf privileges during Convention Week.

Convention entertainment will be the appearance with the Glee Club on Wednesday evening, of the young American soprano, Hallie Stiles, whose most recent triumph at the Opera Comique in Paris this summer, is the topic of musical comment throughout the world. A member of the Chicago Civic Opera Company with which she made a most sensational debut last season, Miss Stiles was described as "the most interesting new personality of the grand opera season." Her foreign debut was made at Deauville in 1925 and met with such success that she was signed to sing "Mimi" at the opening of the next opera season when she was honored by the Opera Comique with a permanent contract. Overnight her success was hailed throughout the musical world of continental Europe and during the following three years at the Opera Comique she was honored with leading roles in "Peleas and Melisande," "Manon," "Butterfly" and "Louise."

Although Paris still claims her for a definite number of performances, she is making her second American concert tour and will appear with the Chicago Civic Opera Company again this season, and it is therefore our good fortune to have her as our soloist. Accompanying music for this Wednesday night concert will be rendered by Phil Spitalny's orchestra and Lew White, one of America's foremost organists.

Lew White is one of America's most famous organists, holding the post of chief organist at the Roxy Theater in New York since its open-

ing, Victor artist and experimental organist, and known and eagerly listened to by America's radio audience. In addition to accompanying the Mendelssohn Glee Club and Miss Stiles, with the Spitalny orchestra, Mr. White will give recitals at various times throughout the period of the convention.

The South Sea Islanders, Hawaiian instrumentalists and singers famed in musical comedy successes, who started the craze for "things Hawaiian" in "The Bird of Paradise," will supplement the convention orchestra on Thursday night's evening of dancing and novelty entertainment, resplendent with the brilliant colors and setting of "A Night in Hawaii." This picture of several thousand gay pleasure-seekers should be a most fitting climax to the entertainment and enjoyment of the 13th Annual Convention of the Association.



Hallie Stiles

Johns Hopkins Course Proves Aid to Gas Industry

ACTIVITIES of the Department of Gas Engineering of The Johns Hopkins University are proving of increased value to the industry, a fact which is emphasized in a detailed report covering the year 1930-31, recently released by Chas. M. Cohn, secretary.

Mr. Cohn points out that the enrollment of new students this month, through additional scholarships and through personal advice to worthy young men to go to Hopkins is desirable and he believes that those who are familiar with excellence of that university's course will not hesitate to assist the institution in securing new students.

The report of the department of Gas Engineering follows:

"The work in gas engineering suffered a serious loss during the past year by the death of Mr. Walter R. Addicks, chairman of the Advisory Committee on Gas Engineering. Mr. Addicks was senior vice-president of the Consolidated Gas Company of New York, director of a dozen associated utilities and a noted engineering figure in the gas industry of the United States. He had taken an interest in the Department of Gas Engineering in the early days of its existence and was one of the leaders in supporting professional research in the Department. His company donated two scholarships and when the Advisory Committee was formed, Mr. Addicks accepted the Chairmanship and his efforts in behalf of the University did much toward securing the funds necessary for the continuance of the work after the expiration of the original underwriting in 1929. He delivered the Gas Engineering Lecture on the Engineering Practice series in 1927 and was constantly interested in the welfare of the department and of the students.

"The remaining members of the Advisory Committee are: Mr. Charles M. Cohn, vice-president of the Consolidated Gas Electric Light and Power Company of Baltimore—Secretary; Mr. Howard Bruce, Chairman of the Board, the Bartlett-Hayward Company; Mr. H. B. Rust, President of the Koppers Company; Mr. H. S. Schutt, Vice-President of the C. H. Geist Company; Mr. Philip H. Gadsden, Vice-President of the United Gas Improvement Company; Mr. L. I. Pollitt, President of the Southern Gas and Electric Corporation.

"One innovation this year was the wide-

spread distribution of theses from this Department. In addition to the publication of journal articles based upon extracts from doctorate researches, the theses as units were published and made available to the industrial and scientific world at the cost of printing and distribution. Editions of from 800 to 1,000 copies were run off, and have been favorably reviewed. The activity will be self-supporting, but was underwritten and so made possible by the generosity of a friend of the Department.

"The cooperative activities of the Department have focused a great many requests upon it, and a great deal of the time of the staff has been required for such service. One of the important services related to the Chemical Committee of the American Gas Association. This Committee through a member of subcommittees develops and supervises a great deal of the technical laboratory methods of the industry and sponsors a yearly program of progress and research, being responsible for the Gas Chemists' Handbook and the Chemical Sessions of the Annual Production Conference. The membership is large, being recruited from all over the country. Dr. Huff is General Chairman of this Committee for 1930-1931, ex-officio Chairman of its Advisory Subcommittee, and is participating in the work of certain of the research subcommittees. Dr. Logan is Chairman of the Subcommittee on Chemical and Scientific Developments in Water Gas Making.

"Dr. Huff has served on the American Gas Association Committee on Cooperation with Educational Institutions, and on the Managing Committee of the Technical Section of the Gas Association.

"The birthplace of the American Gas Industry is Peale's Museum in Baltimore and Dr. Huff was one of a committee of two appointed by the Executive Board of the Association to study the restoration of this Museum.

"Dr. Huff continued to serve the City of Baltimore as a member of the Gas Reference Committee and was appointed Chairman of a subcommittee to which was assigned the development of requirements.

"Dr. Logan is a member of a subcommittee of the American Gas Association Chemical Committee dealing with the revision of methods of testing for ammonium products, and is a member of the subcommittee of the Water Gas Committee dealing with steam decomposition in water gas manufacture.

"Dr. Logan was elected a Fellow by the American Association for the Advancement of Science.

"The truck has continued to show its usefulness in making possible student experimental work under plant conditions and a considerable amount of Senior Laboratory

Work was carried out at the Spring Gardens and Riverside Plants of the Consolidated Gas Electric Light and Power Company of Baltimore.

"Following are the places visited for observations and tests relating to important principles in Gas Engineering:

"Bethlehem Steel Corporation, Sparrows Point, Md.; Front Street Station, Consolidated Gas Electric Light and Power Company of Baltimore, Baltimore, Md.; Astoria and Hunt's Point plants of the Consolidated Gas Company of New York; Seaboard By-Product Coke Company, Kearney, N. J.; Standard Oil Company of New Jersey, Bayway, N. J.; Fixed Nitrogen Research Laboratory, Washington, D. C.; U. S. Bureau of Standards, Washington, D. C.; Geophysical Laboratory, Carnegie Institution, Washington, D. C.; Washington Gas Light Company, Washington, D. C.; Maryland Meter Works, Baltimore, Md.; Bartlett-Hayward Company, Baltimore, Md.; C. M. Kemp Manufacturing Company, Baltimore, Md.; Crown Cork and Seal Company, Baltimore, Md.; Standard Gas Equipment Company, Baltimore, Md.; Continental Can Company, Baltimore, Md.; Porcelain Enamel and Manufacturing Company, Baltimore, Md.; Glidden Company, Baltimore, Md.; The E. H. Koester Company, Baltimore, Md. and Swindell Brothers, Baltimore, Md.

"The research work in the Department of Gas Engineering supported by the Consolidated Gas Electric Light and Power Company of Baltimore, the Consolidated Gas Company of New York, the Mars Company of Oil City, Pennsylvania, and the Rochester (N. Y.) Gas and Electric Corporation is being continued. This study, in progress for several years, has related to studies of present processes of gas manufacture, utilization of plant facilities and the production of by-products. This work is under the direction of Professor Huff, with Dr. O. W. Lusby as senior aide. Mr. D. T. Bonney and a helper are employed in the experimental program.

"The American Gas Association, through a research committee of which Mr. Perry, of Philadelphia was chairman, and Dr. Huff a member, supported research under the direction of Dr. Logan, assisted by Mr. M. A. Elliott, Mr. D. S. Bittinger and a secretary. This was a special study of scientific and economic considerations entering into the production and distribution of certain proposed gas mixtures. An extended report was compiled and it is hoped that it may soon be edited and published.

"Two men pursued full time graduate work in Gas Engineering, taking certain courses in the University designated by the Department.

"The following graduate courses were given:

"Advanced Water Gas Manufacture—two hours weekly throughout the year—Professor Huff.

"Seminar and Journal Meeting—two hours weekly, throughout the year—Professor Huff.

"The Department of Gas Engineering received a new scholarship during the past year from the Atlantic City Gas Company. The following scholarships remained in effect:

"Central Public Service Corporation, 4.

"Consolidated Gas Company of New York, N. Y., 2.

"Atlantic City Gas Company, 1.

"Philadelphia Electric Company, Philadelphia, Pa., 1.

"Columbia Gas and Electric Corporation, 1.

"Consolidated Gas Electric Light & Power Company of Baltimore, 2.

"Washington Gas Light Company, Washington, D. C., 4.

"The Koppers Company, Pittsburgh, Pa., 1.

"The American Gas Association, 1.

"The Department lost the services of Dr. John C. Holtz and Dr. Huff took over the responsibility for the lecture course in Materials of Gas Manufacture while Dr. Logan, with the help of Mr. Martin A. Elliott, took over the laboratory work.

"The usual undergraduate instruction was carried out with an undergraduate enrollment of thirty-one, not including extension course students. Three candidates were recommended for the Bachelor of Engineering degree. Because of the heavy demand for additional evening course work in Gas Engineering a second course was formed, thus giving extension both in Gas and Fuel Analysis, and in Advanced Unit Process Design. The total enrollment in these extension courses numbered thirty-three. Dr. Huff gave both courses and was assisted in the laboratory by Mr. Martin A. Elliott and Mr. Minor C. K. Jones. These two practically assumed the responsibility for the extension course laboratory work in Gas and Fuel Analysis.

"The third and fourth year students and graduate students in Gas Engineering for a number of years have maintained an organization known as the Gas Engineers Association. This has sponsored lectures and educational moving picture exhibits on technical matters relating to Gas Engineering. During the past year this organization was officially recognized by and identified with the American Gas Association as a student chapter.

"During the year the student association sponsored addresses by the following speakers:

"Mr. Charles E. Woollen, Assistant to General Superintendent of the Gas Operating Division of the Consolidated Gas Electric Light and Power Company of Baltimore; Mr. F. S. Tew, representing the Washington Gas Light Company, Washington, D. C.

"The association also exhibited a moving

picture entitled 'The Story of Fireclay Refractories.'

"The annual lecture on Engineering Practice relating to Gas Engineering was entitled 'Some Engineering and Economic Fundamentals of Today's Gas Industry' was given by Mr. A. Gordon King, Service Engineer of the American Gas Association.

"Publications by members of the Department which appeared during the 1930-1931 scholastic year were:

"Wilbert J. Huff—Chapter on Gaseous Fuels in McGraw-Hill Handbook on Chemical Engineering (in press).

"Wilbert J. Huff and C. Gordon Milbourne—Humidity Effects in the Iron Oxide Process for the Removal of Hydrogen Sulfide from Gas, American Gas Association, 1930 Convention; Industrial & Engineering Chemistry, No. 1930.

"Wilbert J. Huff—The Carbon-Sulphur Complex Intermediate in Carbon Disulphide Formation—Soc. Chem. Industry—11. Vol. 50, No. 19, May 8, 1931, (Trans. and Abstracts) pp. 169T-170T.

"C. Gordon Milbourne—The Removal of Hydrogen Sulphide from Gas by Means of Iron Oxide with Special Reference to Humidity Conditions.

"John C. Holtz—The Origin and Decomposition of Organic Sulfur Compounds

under Gas Making Conditions with Particular Reference to the Role of the Carbon-Sulfur Complex.

"Lloyd Logan—An Investigation of the Manufacture of Water Gas with Especial Reference to the Decomposition of Steam.

"Lloyd Logan—Stoichiometry of the Blow—American Gas Journal 134, 1931.

"Lloyd Logan—Further Work on the Decomposition of Steam—Report of Subcommittee on Steam Decomposition in Water Gas Sets, American Gas Association Proceedings (in press).

"Dr. Huff gave the following public addresses during the year:

"Maryland Utilities Association—'The Purification of Gas by Means of Iron Oxide'; Sept. 12, 1930.

"Gas Engineering Technical and Laboratory Staff of the Consolidated Gas Electric Light and Power Company of Baltimore—'Catalyzing the Blue Water Gas Reactions'; November 19, 1930.

"Engineers Club of Baltimore—'The Role of Humidity in Corrosion and Gas Purification'; April 22, 1931.

"Service by consultation was furnished a number of public utility companies and manufacturers of gas equipment, and the University is glad to extend its help wherever possible."

New Gas Rate Schedule in Effect in Brooklyn

A NEW gas rate schedule, providing for a minimum monthly charge and a general revision downward of all follow-up rates, was placed in effect by The Brooklyn Union Gas Company on August 15. The rates were the outgrowth of hearings before the New York State Public Service Commission extending over a period of three years.

The most important feature of the new rate provides for a charge of \$1 per meter as the minimum bill to be rendered under Service Classifications No. 1 and No. 2 which apply to virtually all domestic consumers. Previously the company had suffered a loss in serving the small consumer who used gas infrequently and often received bills as low as 23 cents. Under the new rates \$1 per month will be the minimum bill rendered, for which a customer may use up to and including 600 cu.ft.

A second important change is the lowering of the rate applying to gas used by domestic consumers in excess of the 600 cu.ft. minimum. The new schedule fixes this rate at 9½ cents per hundred cubic feet.

Wholesale users may benefit by the new rates. Under Service Classification No. 3 any customer who will agree in advance to use and/or pay for not less than 100,000 cu.ft. in each of three or more consecutive months in each year can obtain a rate of 7 cents per 100 cu.ft. for all over and above 500,000 cu.ft. metered per month.

Customers exercising the option to be served under Service Classification No. 3 will, however, be required to pay a fixed demand charge each month, based on their maximum 24-hour use of gas at any time within the months of December to March, both inclusive, in addition to the amount charged for the gas consumed. For each 100 cu.ft. of such maximum use or demand so determined, he will be required to pay 50 cents per month for each month in the year.

Formerly the rates which applied to all customers were:

Per Meter Per Month		
First	100,000 cu.ft.	\$1.15 per M
Next	200,000 cu.ft.	1.10 per M
Next	300,000 cu.ft.	1.05 per M
Next	400,000 cu.ft.	1.00 per M
All over	1,000,000 cu.ft.	.95 per M

(Continued on page 421)

Johns Hopkins Course Proves Aid to Gas Industry

ACTIVITIES of the Department of Gas Engineering of the Johns Hopkins University are proving of increased value to the industry, a fact which is emphasized in a detailed report covering the year 1930-31, recently released by Chas. M. Cohn, secretary.

Mr. Cohn points out that the enrollment of new students this month, through additional scholarships and through personal advice to worthy young men to go to Hopkins is desirable and he believes that those who are familiar with excellence of that university's course will not hesitate to assist the institution in securing new students.

The report of the department of Gas Engineering follows:

"The work in gas engineering suffered a serious loss during the past year by the death of Mr. Walter R. Addicks, chairman of the Advisory Committee on Gas Engineering. Mr. Addicks was senior vice-president of the Consolidated Gas Company of New York, director of a dozen associated utilities and a noted engineering figure in the gas industry of the United States. He had taken an interest in the Department of Gas Engineering in the early days of its existence and was one of the leaders in supporting professional research in the Department. His company donated two scholarships and when the Advisory Committee was formed, Mr. Addicks accepted the Chairmanship and his efforts in behalf of the University did much toward securing the funds necessary for the continuance of the work after the expiration of the original underwriting in 1929. He delivered the Gas Engineering Lecture on the Engineering Practice series in 1927 and was constantly interested in the welfare of the department and of the students.

"The remaining members of the Advisory Committee are: Mr. Charles M. Cohn, vice-president of the Consolidated Gas Electric Light and Power Company of Baltimore—Secretary; Mr. Howard Bruce, Chairman of the Board, the Bartlett-Hayward Company; Mr. H. B. Rust, President of the Koppers Company; Mr. H. S. Schutt, Vice-President of the C. H. Geist Company; Mr. Philip H. Gadsden, Vice-President of the United Gas Improvement Company; Mr. L. I. Pollitt, President of the Southern Gas and Electric Corporation.

"One innovation this year was the wide-

spread distribution of theses from this Department. In addition to the publication of journal articles based upon extracts from doctorate researches, the theses as units were published and made available to the industrial and scientific world at the cost of printing and distribution. Editions of from 800 to 1,000 copies were run off, and have been favorably reviewed. The activity will be self-supporting, but was underwritten and so made possible by the generosity of a friend of the Department.

"The cooperative activities of the Department have focused a great many requests upon it, and a great deal of the time of the staff has been required for such service. One of the important services related to the Chemical Committee of the American Gas Association. This Committee through a member of subcommittees develops and supervises a great deal of the technical laboratory methods of the industry and sponsors a yearly program of progress and research, being responsible for the Gas Chemists' Handbook and the Chemical Sessions of the Annual Production Conference. The membership is large, being recruited from all over the country. Dr. Huff is General Chairman of this Committee for 1930-1931, ex-officio Chairman of its Advisory Subcommittee, and is participating in the work of certain of the research subcommittees. Dr. Logan is Chairman of the Subcommittee on Chemical and Scientific Developments in Water Gas Making.

"Dr. Huff has served on the American Gas Association Committee on Cooperation with Educational Institutions, and on the Managing Committee of the Technical Section of the Gas Association.

"The birthplace of the American Gas Industry is Peale's Museum in Baltimore and Dr. Huff was one of a committee of two appointed by the Executive Board of the Association to study the restoration of this Museum.

"Dr. Huff continued to serve the City of Baltimore as a member of the Gas Reference Committee and was appointed Chairman of a subcommittee to which was assigned the development of requirements.

"Dr. Logan is a member of a subcommittee of the American Gas Association Chemical Committee dealing with the revision of methods of testing for ammonium products, and is a member of the subcommittee of the Water Gas Committee dealing with steam decomposition in water gas manufacture.

"Dr. Logan was elected a Fellow by the American Association for the Advancement of Science.

"The truck has continued to show its usefulness in making possible student experimental work under plant conditions and a considerable amount of Senior Laboratory

Work was carried out at the Spring Gardens and Riverside Plants of the Consolidated Gas Electric Light and Power Company of Baltimore.

"Following are the places visited for observations and tests relating to important principles in Gas Engineering:

"Bethlehem Steel Corporation, Sparrows Point, Md.; Front Street Station, Consolidated Gas Electric Light and Power Company of Baltimore, Baltimore, Md.; Astoria and Hunt's Point plants of the Consolidated Gas Company of New York; Seaboard By-Product Coke Company, Kearney, N. J.; Standard Oil Company of New Jersey, Bayway, N. J.; Fixed Nitrogen Research Laboratory, Washington, D. C.; U. S. Bureau of Standards, Washington, D. C.; Geophysical Laboratory, Carnegie Institution, Washington, D. C.; Washington Gas Light Company, Washington, D. C.; Maryland Meter Works, Baltimore, Md.; Bartlett-Hayward Company, Baltimore, Md.; C. M. Kemp Manufacturing Company, Baltimore, Md.; Crown Cork and Seal Company, Baltimore, Md.; Standard Gas Equipment Company, Baltimore, Md.; Continental Can Company, Baltimore, Md.; Porcelain Enamel and Manufacturing Company, Baltimore, Md.; Glidden Company, Baltimore, Md.; The E. H. Koester Company, Baltimore, Md. and Swindell Brothers, Baltimore, Md.

"The research work in the Department of Gas Engineering supported by the Consolidated Gas Electric Light and Power Company of Baltimore, the Consolidated Gas Company of New York, the Mars Company of Oil City, Pennsylvania, and the Rochester (N. Y.) Gas and Electric Corporation is being continued. This study, in progress for several years, has related to studies of present processes of gas manufacture, utilization of plant facilities and the production of by-products. This work is under the direction of Professor Huff, with Dr. O. W. Lusby as senior aide. Mr. D. T. Bonney and a helper are employed in the experimental program.

"The American Gas Association, through a research committee of which Mr. Perry, of Philadelphia was chairman, and Dr. Huff a member, supported research under the direction of Dr. Logan, assisted by Mr. M. A. Elliott, Mr. D. S. Bittinger and a secretary. This was a special study of scientific and economic considerations entering into the production and distribution of certain proposed gas mixtures. An extended report was compiled and it is hoped that it may soon be edited and published.

"Two men pursued full time graduate work in Gas Engineering, taking certain courses in the University designated by the Department.

"The following graduate courses were given:

"Advanced Water Gas Manufacture—two hours weekly throughout the year—Professor Huff.

"Seminar and Journal Meeting—two hours weekly, throughout the year—Professor Huff.

"The Department of Gas Engineering received a new scholarship during the past year from the Atlantic City Gas Company. The following scholarships remained in effect:

"Central Public Service Corporation, 4.
"Consolidated Gas Company of New York, N. Y., 2.

"Atlantic City Gas Company, 1.
"Philadelphia Electric Company, Philadelphia, Pa., 1.

"Columbia Gas and Electric Corporation, 1.

"Consolidated Gas Electric Light & Power Company of Baltimore, 2.

"Washington Gas Light Company, Washington, D. C., 4.

"The Koppers Company, Pittsburgh, Pa., 1.

"The American Gas Association, 1.

"The Department lost the services of Dr. John C. Holtz and Dr. Huff took over the responsibility for the lecture course in Materials of Gas Manufacture while Dr. Logan, with the help of Mr. Martin A. Elliott, took over the laboratory work.

"The usual undergraduate instruction was carried out with an undergraduate enrollment of thirty-one, not including extension course students. Three candidates were recommended for the Bachelor of Engineering degree. Because of the heavy demand for additional evening course work in Gas Engineering a second course was formed, thus giving extension both in Gas and Fuel Analysis, and in Advanced Unit Process Design. The total enrollment in these extension courses numbered thirty-three. Dr. Huff gave both courses and was assisted in the laboratory by Mr. Martin A. Elliott and Mr. Minor C. K. Jones. These two practically assumed the responsibility for the extension course laboratory work in Gas and Fuel Analysis.

"The third and fourth year students and graduate students in Gas Engineering for a number of years have maintained an organization known as the Gas Engineers Association. This has sponsored lectures and educational moving picture exhibits on technical matters relating to Gas Engineering. During the past year this organization was officially recognized by and identified with the American Gas Association as a student chapter.

"During the year the student association sponsored addresses by the following speakers:

"Mr. Charles E. Woollen, Assistant to General Superintendent of the Gas Operating Division of the Consolidated Gas Electric Light and Power Company of Baltimore; Mr. F. S. Tew, representing the Washington Gas Light Company, Washington, D. C.

"The association also exhibited a moving

picture entitled 'The Story of Fireclay Refractories.'

"The annual lecture on Engineering Practice relating to Gas Engineering was entitled 'Some Engineering and Economic Fundamentals of Today's Gas Industry' was given by Mr. A. Gordon King, Service Engineer of the American Gas Association.

"Publications by members of the Department which appeared during the 1930-1931 scholastic year were:

"Wilbert J. Huff—Chapter on Gaseous Fuels in McGraw-Hill Handbook on Chemical Engineering (in press).

"Wilbert J. Huff and C. Gordon Milbourne—Humidity Effects in the Iron Oxide Process for the Removal of Hydrogen Sulfide from Gas, American Gas Association, 1930 Convention; Industrial & Engineering Chemistry, No. 1930.

"Wilbert J. Huff—The Carbon-Sulphur Complex Intermediate in Carbon Disulphide Formation—Soc. Chem. Industry—11. Vol. 50, No. 19, May 8, 1931, (Trans. and Abstracts) pp. 169T-170T.

"C. Gordon Milbourne—The Removal of Hydrogen Sulphide from Gas by Means of Iron Oxide with Special Reference to Humidity Conditions.

"John C. Holtz—The Origin and Decomposition of Organic Sulfur Compounds

under Gas Making Conditions with Particular Reference to the Role of the Carbon-Sulfur Complex.

"Lloyd Logan—An Investigation of the Manufacture of Water Gas with Especial Reference to the Decomposition of Steam.

"Lloyd Logan—Stoichiometry of the Blow—American Gas Journal 134, 1931.

"Lloyd Logan—Further Work on the Decomposition of Steam—Report of Subcommittee on Steam Decomposition in Water Gas Sets, American Gas Association Proceedings (in press).

"Dr. Huff gave the following public addresses during the year:

"Maryland Utilities Association—'The Purification of Gas by Means of Iron Oxide'; Sept. 12, 1930.

"Gas Engineering Technical and Laboratory Staff of the Consolidated Gas Electric Light and Power Company of Baltimore—'Catalyzing the Blue Water Gas Reactions'; November 19, 1930.

"Engineers Club of Baltimore—'The Role of Humidity in Corrosion and Gas Purification'; April 22, 1931.

"Service by consultation was furnished a number of public utility companies and manufacturers of gas equipment, and the University is glad to extend its help wherever possible."

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(Continued on page 421)

How A. G. A. Testing Laboratory Can Assist in Promoting Industrial Use of Gas



R. M. Conner

IT was the intention of those primarily responsible for the establishment of the Association's Testing Laboratory to found an institution not only for the purpose of carrying out a program of testing and certification of domestic gas equipment, but also for the purpose of providing a national organization that could conduct research problems of a scientific nature essential to the successful promotion of the use of city gas. In reviewing the activities of this organization we find that they have followed more or less along such lines. Major activities to date, however, have been confined to testing domestic gas appliances because of the tremendous demand which developed for such services. During the last two years a rapidly increasing amount of investigational work has also developed and it is doubtful if the gas industry has as yet taken full advantage of the resources of the Laboratory for practical and theoretical investigational work.

The possibilities offered the gas industry from the standpoint of industrial uses of our produce are so numerous that to list them would require us to enumerate the great majority of the heating processes involved in all industrial applications. A great deal of progress has been made during the past five years in the development of this market by the Committee on Industrial Gas Research. This group's activities which have been most carefully planned to meet the needs of the industry as a whole, by a special committee of the Executive Board on Industrial Gas

By R. M. CONNER,
Director, American Gas Association
Testing Laboratory

Utilization, have not only been carried forward successfully but have been added to from time to time as knowledge and experience gained has justified.

The depression through which we are now passing makes it necessary for every industry to investigate in minute detail every possibility for trade expansion. These possibilities are of as much importance to the small producer such as the corner baker, as they are to the large manufacturer for each has his own market to protect and his trade to expand and develop. A fraction of a cent saved here and there in mass production soon multiplies into thousands of dollars. The gas industry, therefore, must be prepared to demonstrate that it has a fuel which can be most efficiently applied wherever heat is required at a resulting lower cost than most fuels when considering quality and cost of the finished product.

It has been pointed out that the field for the application of gas to industrial processes is almost unlimited. How then may the gas industry prepare to take advantage of this seemingly unlimited potential market for its product? Fortunately, the work of the Industrial Gas Research Committee has pointed the way to accomplish this end. The gas industry must endeavor to develop new uses for gas and be alert to new heating processes where gas may be applied as well as to new and more efficient methods for carrying out old processes. There are still many improvised heating processes where gas is being used extravagantly. Unless such installations are brought up to conform to modern practices many

of them later on will be lost to gas forever. The loss of good-will through a transaction of this kind is also often more serious than the loss of the installation itself.

Not only is the operating cost of industrial gas heating equipment important but the desired quality of the product must always be maintained. The saving of space due to fuel storage, the freedom from dirt and ashes, accurate temperature maintenance and automatic control are all features which make gas a desirable fuel for industrial purposes, but these items, as desirable as they may be, do not entirely solve the problem, they must be supplemented by most of the other important factors mentioned heretofore.

The question that arises is how is the gas industry to discover the ways and means of applying its product most advantageously to industrial heating processes? The answer to this gives rise to numerous other questions which first must be satisfactorily answered, among which are the following:

- (1) What heating processes exist in different industries and to how many of them can gas be successfully applied?
- (2) What are the heat and quality of product requirements of such processes?
- (3) How can the maximum overall efficiency be obtained?
- (4) What are the effects, if any, of the products of combustion on the various manufactured products?
- (5) If desirable how can furnace atmospheres be properly controlled?
- (6) How can proper and accurate temperatures be maintained?

The answer to all of these and numerous other pertinent questions can be most satisfactorily arrived at

through properly planned and intelligently directed research. Every effort should be made to bring the application of gas to various industrial processes in line with sound business practice. It seems that the A. G. A. Laboratory with its background of experience on thousands of domestic gas appliances, including its research on mixed gases, rate of flame propagation, etc., is in a splendid position to assist in promoting greater industrial use of gas. It also has contact through the Association with manufacturers of equipment and is familiar with the various sources from which equipment can be procured so that representative types may be obtained for study when needed.

As the Laboratory is a neutral body, its investigational work should be unbiased and the results of its investigations interpreted for the benefit and advancement of the industry as a whole. It is centrally located, has the benefit of the use of all types of city gases; has facilities and equipment for research work, or can readily secure them; and is located in a large city where manufacturing is exceptionally diversified with the result that contacts could probably be made to study the practical application of the great majority of industrial problems after the underlying principles had been discovered by research work.

It is important from an association standpoint that data be developed from industrial gas research which can be applied generally, and not limited to certain sections or conditions. Industrial applications should be studied from the standpoint of not only one, but all kinds of city gases. A satisfactory application of one kind of manufactured gas to a heating process does not mean necessarily that it will work satisfactorily with natural gas or with other kinds of manufactured gas. Neither can it be presumed that the successful use of natural gas for a given process insures proper results when manufactured gas is substituted unless proper and compensating changes in equipment are made. The Laboratory can readily duplicate representative types of gases distributed throughout the United States and Canada, which is

of the utmost importance in arriving at a satisfactory solution of any industrial heating problem.

In addition to the above points the Laboratory should be able to conduct research at less expense than any outside agency since its approval testing and inspection activities are entirely self-supporting. Furthermore, the Laboratory is a non-profit making institution. As a consequence any research project undertaken bears only the direct costs it involves together with such administrative and similar charges which arise in connection with it.

The year of 1930 marked the entry of the Laboratory into industrial research when two problems of a fundamental nature were assigned it for investigation. During May of this year a third and similar project was also assigned.

The greater part of the work which has been carried on at the Laboratory by this organization has pertained largely to domestic usage. When operations were first started it was necessary to assemble and develop a staff for this work, and to acquire the necessary apparatus to use for the various tests and research problems. This was done and today, the Laboratory is probably generally recognized as an established authority in its field. A similar development might logically be expected to follow in the industrial gas research field. Special equipment for such work could readily be acquired or developed which would probably be superior to that found in the average industrial laboratory which adapts its equipment to any kind of problem supplied and therefore must, of necessity, be of more of a general nature.

An extract from the report of the Committee on Association Activities as adopted by the American Gas Association as a part of the new Five-Year Plan of Association Activities for the development of the gas industry reads as follows:

"Our experience with the research and industrial application of gas has strengthened the faith of our people in research in general, and it should not be confined to the development of appliances. The fields of production and distribution of both manufactured and natural gas offer many opportunities for valuable research. It is,

therefore, of the greatest importance that the Executive Board continue the work according to its best judgment and information as regards the obtaining and application of the necessary funds, "and that wherever practicable the facilities of the Association's Testing Laboratory should be utilized in working out research problems of the industry."

It seems only logical that the view expressed by the Association's managing director, in an address delivered before the Mid-West Gas Association in April of this year, concerning the future activities of the Laboratory, should become an accomplished fact within a period of the next few years. Major Forward pointed out that there should be a resolute prosecution of research not only in present fields but in a gradually broadening scope, centering largely in the Cleveland Laboratory, stating further that "As the testing of appliances becomes more and more of a routine matter, we may expect the Laboratory to gradually unfold in research work for the industry and to assume the aspect of a great institution upon which the industry may draw for the essential technical facts concerning its service."

Lighting of Statue of Liberty

A LONG buried human interest story concerning the Statue of Liberty, Henry L. Doherty and *The World*, has been brought to light for the first time in the July 18 issue of Cleveland Town Tidings, a weekly society paper published in Cleveland.

The Statue of Liberty, America's Centennial present from France, was unveiled in October, 1886. Thirty years after the *New York World* started a subscription list to build a flood lighting system to make Liberty stand out from the nighttime darkness of the harbor. *The World* headed the list with a subscription of \$1,000 and some 80,000 persons contributed to the illumination fund.

Before starting the subscription list *The World* called on Mr. Doherty to underwrite the fund. Mr. Doherty agreed to bear any deficit which might result when the books were finally balanced. His only stipulation was that neither his name nor that of George Williams, his associate who conceived the idea and proposed it to *The World*, should be used in connection with the matter.

The deficit, which was wiped out by Mr. Doherty's check, ran into thousands of dollars. That was fifteen years ago, and even Mr. Doherty's closest associates knew nothing of his public spirited deed until the story appeared in Cleveland Tidings.

Southern Industries

Speed Up With Gas



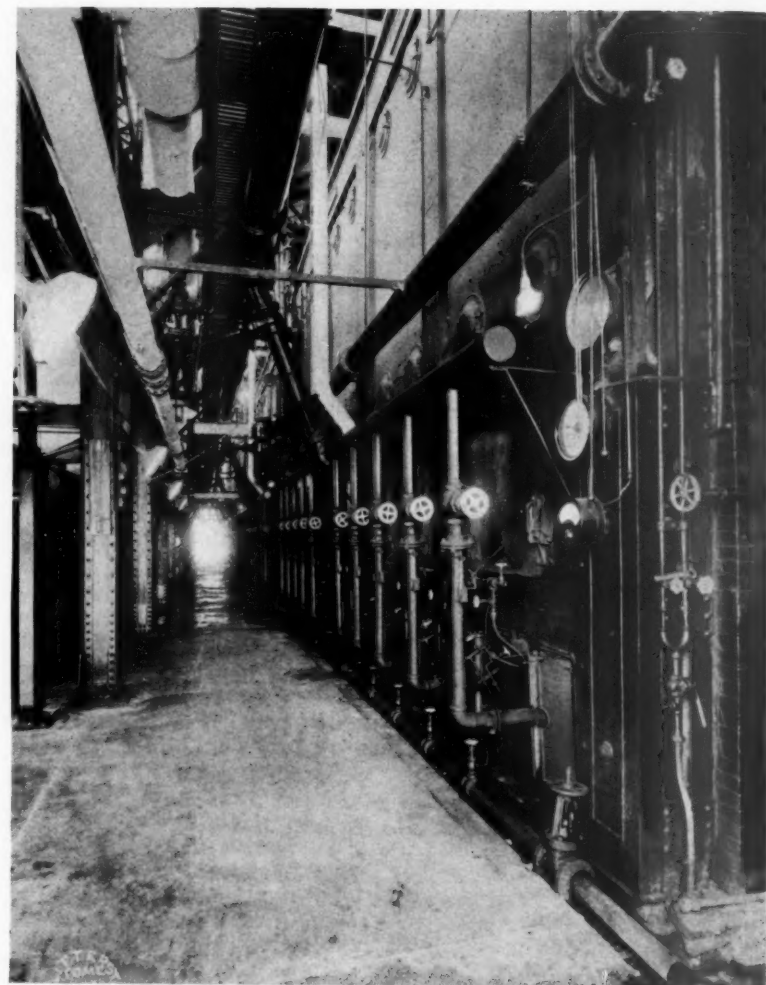
J. B. Nealey

ONE of the most outstanding trends in industry, at the moment, is the rapidly expanding use of gas in the Southern States. More efficient and economical methods of process heating are the

order of the day and this refined fuel is the answer.

Gas is a direct competitor of coal in the field of power, and displaces this raw fuel wherever it is offered at competitive prices. As proof of this we have the ever increasing use of gas by the electric utilities, this increase amounting to 50 per cent in 1929. Today millions of cu.ft. are used under the steam boilers of electric generating plants. A good example of this is the new plant of the Houston Light & Power Co., Houston, Texas, which serves that city and more than seventy-five towns in the surrounding territory with electricity. It has just constructed a new unit which is one of the most modern and up-to-date electric generating plants in the country.

In line with the recent trend of building larger boiler units with higher steam pressures, the two new boilers recently built at the Deepwater plant with water walls, superheaters, steam and air reheaters and economizers, will stand a pressure of 1,450 lbs. There is only one other boiler installation comparable with this one in the State of Texas and



View of Gas-fired Boilers Used in Heating Water and Making Steam at the Plant of the Freeport Sulphur Company, Freeport, Texas

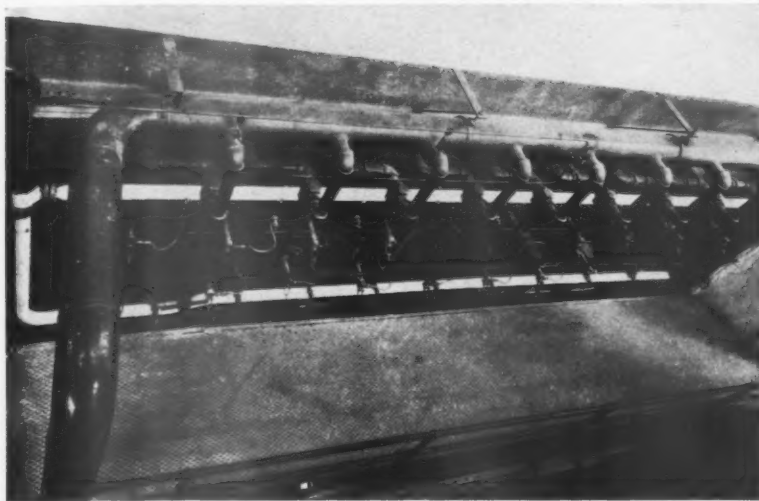
only a few in the United States.

These boilers, together with the other boilers in this plant, are fired with gas. Twenty gas burners, each arranged in two rows, fire directly into the fire box, through a wind box, the hot products of combustion rising up through the boiler tubes, through the economizer, through the air preheater and out the stack. Forced and induced drafts, created by motor driven fans, control the flow of heat, and just before it goes out the stack it is used in a preheater

By J. B. NEALEY,
American Gas Association

to heat fresh air for combustion at the burners.

The preheater consists of a series of narrow sheet steel boxes in one large box, the waste products of combustion passing between the small boxes while fresh air, taken from around the top of the boiler, is passed through the boxes or heat interchangers. This air is preheated and is then forced down into the wind box, in front of the boilers, to supply the gas burners which protrude



Bank of Natural Gas Burners Firing Boilers at the New Plant of the Houston Light & Power Co., Houston, Texas

through the windbox and fire into the fire box through ports.

The type of burner used consists mainly of the air register and gas burner while there is also an oil burning attachment for use where gas is not available. The air register consists of two cast-iron plates held together with bolts and pipe sleeves while the entire periphery with sheet steel, cut into segments, each segment mounted on a sleeve as a hinge and acts as a door. The air for combustion is drawn in through these doors from the windbox and its volume and velocity are controlled by opening and shutting the doors or vanes to the width desired. The outer plate of this burner is sealed into the outer wall of the windbox, the burner projects into the windbox and fires through a port in the inner wall directly into the firebox.

The gas burner is a hollow annular ring bolted to the inner plate of the air register, the gas entering through one large inlet and issuing through a large number of small ports in the inner periphery of the ring. The entering air is given a rotary motion by the setting of the doors or vanes in the register so that the air and gas are instantly and thoroughly mixed.

Another noticeable trend is that among large institutions such as hotels, apartment stores, office buildings, hospitals, etc., etc. to use but one fuel, and that gas, for power,

light, heat, cooking, baking, water heating, etc. This simplifies matters materially and solves many engineering problems, for with gas-fired boilers, light, heat and power are readily available and the same gas line that supplies the boilers can be tapped into the kitchens, laundries, etc.

An excellent example of this is the power plant of the St. Charles Hotel, New Orleans, La., which consists of

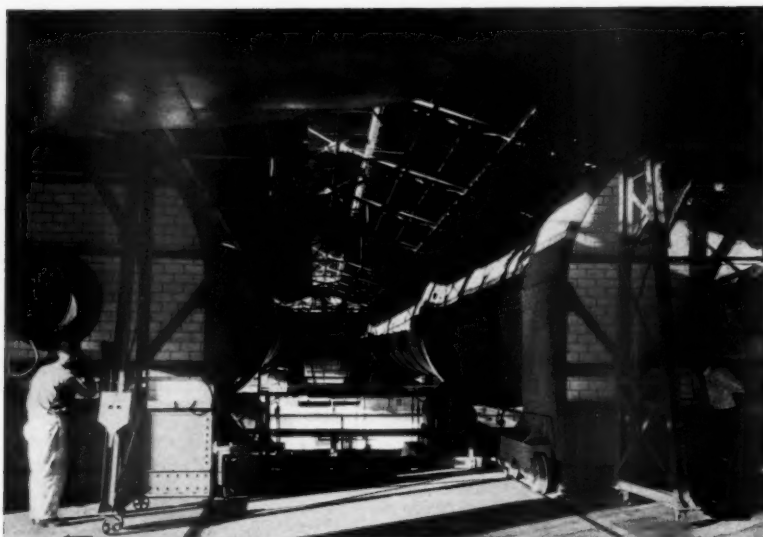
three Heine boilers, one of 200-horsepower and fire with a single gas burner, and the other two are 500-horsepower each and heated with three gas burners each. Originally these were fired with coal and then they were converted to oil-gas burning; in other words, the burners are so constructed that either oil or gas can be used in them. At first oil was tried and then gas fuel was adopted with a saving of \$3,500 a year over oil.

The steam pressure of the boilers is automatically maintained by means of a regulator consisting of a governor, the diaphragm of which is weighted to balance the pressure desired. When the pressure rises above this point, the diaphragm is forced down and pushes with it a rod that is directly connected with a valve in the gas supply line. This cuts the flow of gas so that the flames under the boiler are reduced to a minimum. At the same time another rod closes the damper in the waste flue to the stack. Conversely, when the pressure drops, the gas valve is opened wide, the flames blaze out under the boilers again and the damper is reopened. This is all automatic and the desired steam pressure is maintained with a minimum fluctuation and a minimum fuel consumption.

The three boilers are connected to



Charging Pot Loaded with Steel Parts and Carburizing Compound into Furnace Will Dolly at Plant of the Guiberson Corporation, Dallas, Texas



Showing Discharge End of Kilns and Gas Burners by Which They Are Fired in Plant of Republic Portland Cement Co., San Antonio, Texas

a single steam header and from this header are three takeoffs; one to the generator engines, one to the kitchen and one to the laundry. The first serves four steam engines which are directly connected to the generators. These engines are 425 hp., 325 hp., 70 hp. and 70 hp., respectively. This takeoff also serves two steam-driven compressors, a five-ton ice-making plant and a ten-ton brine circulating refrigerating plant for the various ice boxes in the kitchen and store-rooms.

The current produced by the generators is wired to a central board and from there is distributed to the different circuits in the building. From this board are operated the elevator motors, print shop motors, laundry motors, several hundred fan motors, more than 15,000 electric lights, maintenance machine shop motors, hot water pump motors, etc.

Exhaust steam from the engines is run through two hot water heaters furnishing hot water for the hotel. These are cylindrical steel tanks containing copper tube coils, the steam released in the tanks heating the water in the coils. The exhaust steam from these is piped to the boiler feed water heater. From here it is exhausted into the air in the summer time but during the winter is turned into the steam radiator heating system of the building. A vacuum pump

returns the condensate to the boiler water feed heater.

In the laundry steam is used in the mangles, dry house, dry tumbling, presses, etc. The dry house is of insulated sheet steel construction with a series of steam coils arranged on the sides, bottom and top. An overhead track, from which is suspended an endless chain, loops back and forth eight times in this dryer. This conveyor is motor driven from sprockets and about eight feet of it travels in front of the dryer, between the inlet and outlet apertures. Here the clothes are hung on hooks suspended from the conveyor, and after traveling through the dryer, are taken off dry at the same point.

The kitchen is modern in every respect and the equipment is so laid out as to minimize the work of the chefs, cooks, etc. There are four gas ranges, a gas broiler, two steam stock kettles, steam vegetable cooker, two steam tables with plate warmers, a gas-heated waffle plate, a gas hot cake plate, two gas coffee urns and a gas hot water urn. A bakery is located next to the kitchen and contains a gas-fired peel oven for baking bread and is heated with a single gas burner cemented into the front wall and firing beneath the hearth. There is also a sheet steel box proofer into which steam is injected which furnishes both the heat and humidity

desired. This kitchen serves a main dining room, a banquet hall, a coffee shop, and other smaller dining rooms. Room service is also provided for from here.

Flintkote is a popular roofing, so popular that the Flintkote Co. maintains a number of plants to supply the demand. This roofing consists of a heavy sheet felt base made from rags which is saturated in asphalt, and then covered on both sides with asphalt. The weather surface is usually coated with crushed slate and the under surface with mica or tale. It is put out in both sheet and shingle form, the former being put up in rolls and the latter in bundles for ease in handling.

The felt base is made from rags in a modified paper mill. Two grades of crude asphalt are used and these are oxidized or "blown" in a series of 10 stills. These stills are horizontal, ranging in capacity from 3,500 to 10,000 gal. each, and each is provided with air tubes in the bottom through which a blower forces air during the refining process. Heat is supplied through one low-pressure gas burner per still, this being located in the front brick work, close to the bottom. The sheets of felt base are passed through the saturation tank by a series of steam heated rolls and when it emerges the excess asphalt is squeezed off between other rolls. The sheet then passes through the coating machine where hot coating asphalt is applied to both sides at a temperature of about 400 deg. F.

The melted asphalt is pumped from the still to a superheater, or continuous heater, and then to the saturation tanks. The superheaters are simply banks of boiler tubes set in brick furnaces and heated with gas burners at both ends. A motor driven pump keeps the asphalt circulating through the superheaters into the tank and back again so that it is maintained at a constant temperature of 430 deg. F. A magnetic shutoff valve is cut into the gas supply line and this automatically shuts off the fuel supply to the burners in the event that the current to the motor should fail.

In Texas they are making lime from oyster shells which they first dredge up from the sea bottom and

then put through a giant calciner. This is being done by the Haden Lime Co. near Houston, Texas, which has built one of the world's most novel plants for this kind of work. The calciner is a heavy steel shell tubular in shape and 60 ft. long and 6 ft. in diameter. It rests on supports and requires a 30-horsepower motor to rotate it. Heat is supplied by a single gas burner of great capacity located in the discharge end and which fires directly into it, burning the shell to a clinker.

Hot air for combustion is drawn from over the calcining zone of the kiln, which is hooded, and forced into the burner by fan. There is a 94-ft. stack at the charging end of the kiln through which the waste products of combustion are drawn by natural draft. The discharge end of the kiln is covered with a removable brick hood in which the gas burner is located. This hood allows the calcined material to drop from the end of the kiln down into the charging end of the cooler which is similar in shape and construction.

Gigantic cakes of pure sulphur lie buried hundreds of feet deep in the earth in the State of Texas and a most ingenious method has been devised to mine this. A well is sunk to the sulphur and several pipes, one within the other are put down. Hot water is forced down through one to the sulphur which it melts and steam is then forced down and the pressure forces the sulphur to the surface where it is cooled and shipped to market. The largest item of equipment used is the bank of giant steam boilers for the raising of steam and heating of the water. These are all fired with gas.

The Freeport Sulphur Co., Freeport, Texas, is the world's second largest sulphur producer and this and one other company produces 85 per cent of the world's supply of sulphur. A bank of twelve steam boilers of 700 horsepower each is employed and each is fired with five gas burners. Regardless of the type or size of steam boilers, gas burners are now available that can be used in the place of coal. These burners are complete combustion units and most

of them are provided with complete automatic controls so that the desired steam pressure can be maintained mechanically and without the attention of an operator.

The gas burner here used is of the low-pressure, atmospheric type consisting of air damper and frame, gas manifold and refractory mixing block and primary air for combustion only is used. Each burner consists of a number of short mixing tubes in the rectangular shaped manifold, each one of which is supplied with gas through four jets meeting at a central predetermined point in the mixing tube. These boilers furnish steam to three turbo-generators which in turn supply electric current for motors operating drilling equipment and some of the pumps in the field. The remainder of the steam is employed in the engines operating the thirty-six pumps in the plant as well as the air compressors. The exhaust steam is piped to the eight water heaters.

At the power plant, pumps lift the cold water to the heaters where it meets the live steam and is heated to 340 deg. F. and then other pumps force the hot water through pipe lines to the various wells in the field, and thence underground to the sulphur deposits. The distances through which this water is carried vary from 2,000 to 5,000 feet.

Heat treating is another industry where gas betters the product, cuts the rejects and reduces the costs. An exemplification of this is to be had at the plant of the Guiberson Corp., Dallas, Texas, manufacturers of oil well supplies where the heat treating department is served by thirteen gas furnaces in which the products are heat treated. This heat treating room layout, including furnaces, air and gas lines, boosters, quenchers, hoists, etc. provides the greatest flexibility for handling and control.

The furnaces are of the periodic type, constructed of cast-iron shapes and lined with refractory material. Each is heated with four gas burners. These furnaces are arranged in two rows, on opposite sides of the room and cylindrical steel tanks for quenching are sunk in the floor be-

tween the two rows. More than 200,000 different parts are produced in this plant some of which are forgings ranging in weight up to two tons.

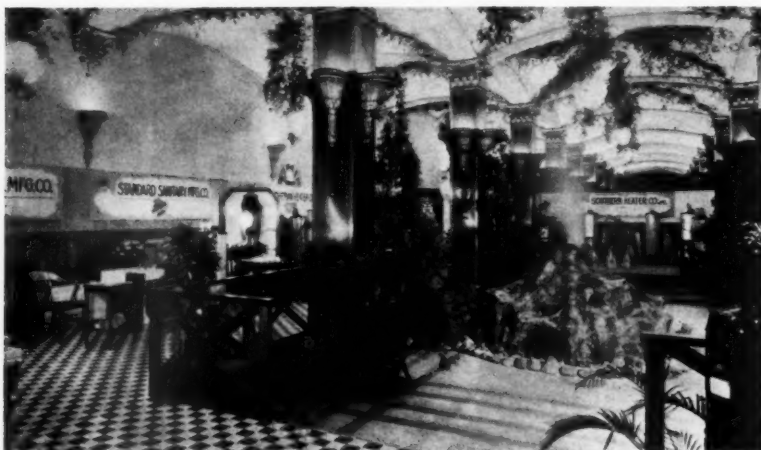
Cement plants throughout the South and elsewhere have found gas to be the better fuel as indicated by results produced at the plant of the Republic Portland Cement Co., San Antonio, Texas, which has a capacity for 4,000 bbls. per day. The kilns used here are unusually large being 11 ft. in diameter and 250 ft. long. These steel cylinders are carried on four riding rings with two roller type supports. The gas burners, blowers and control panels are located on the firing deck at the discharge end of the kilns.

Two burners were formerly used for each of the two kilns, using gas at 8 oz. pressure, but it was found more economical and efficient to employ gas and air at a higher pressure and with a single gas burner for each. The type of gas burner employed consists of two cast-iron parts, the mixing chamber and the nozzle. The mixing chamber again consists of two hollow castings, one outside the other so as to form a jacket around it. Small perforated pipes cross the large center opening through the inner casting, fanlike, the ends terminating in the wall, which is drilled, so that gas forced into the jacket will pass into the pipes and out through the perforations. Each end of the mixing chamber terminates in a neck about 2½ ft. in diameter, the burner nozzle being bolted to one and the hot air flue to the other.

Wm. H. Crutcher Dies at Oklahoma Home

William H. Crutcher, eastern division manager of the Oklahoma Gas & Electric Company, died at his home in Muskogee, Okla., July 28 from a heart attack. Mr. Crutcher had been in Muskogee eight years, moving there from Oklahoma City where he was manager of gas operations for the Oklahoma Gas & Electric Company. He was prominent in Oklahoma utility circles for 13 years, having come to the state in 1918.

His suggestion originated the Southwestern Gas Measurement Short Course held annually at the University of Oklahoma at Norman, Okla., which has become the leading project of its kind in the United States.



Glimpse of New Orleans Hot Water Service Show Showing Replica of "Old Faithful" Geyser at Right

New Orleans Hot Water Heater Show

NEW ORLEANS' first annual hot water service show, featuring the latest developments in automatic water heating and its uses as an aid to health and cleanliness, was held in New Orleans Public Service, Inc., building, July 13-18.

This show, which drew an attendance of more than 25,000, despite three days of unusually inclement weather, was sponsored by the New Orleans Hot Water Service Association, which is composed of water heater dealers, licensed master plumbers, and New Orleans Public Service, Inc.

The company at the present time, in order to increase its gas and electric load, is concentrating particularly on the promotion of automatic refrigeration and automatic water heating.

A "food preservation show" was staged last year in cooperation with the various refrigeration dealers, which met with such pronounced success that it was considered advisable to arrange a "water heater show" of a similar nature. The decorative theme and feature attractions of the show were worked out through conferences between the commercial and advertising

departments of the company, water heater dealers, and licensed master plumbers.

It was realized that special attractions other than the mere display of water heaters would be necessary in order to attract a crowd. After considerable investigation it was decided to create a replica of the famous "Old Faithful" geyser of Yellowstone Park, on the display floor as a special feature of the Show. This attraction lent itself to the show type of advertising copy, and at the same time epitomized hot water. Other features were a giant water heater erected on the marquee of the building, towering more than thirty feet high, also an elaborate show-window display depicting the evolution of water heating through the ages. Beautiful fountains in a setting of tropical shrubbery added further attractiveness to the show, and unusual care was given to ornamental lighting effects which made the entire display floor a colorful and attractive scene. Special music was a feature of the show.

Each of the seven New Orleans water heater dealers was given a special booth on a raised platform, which made possible water and gas

connections for the actual demonstration of the heaters. The water heater dealers took particular pains to make their booths attractive, and were able to give an effective demonstration of the operation of their particular heaters.

In the set-up of the show no expense devolved upon the dealers themselves other than moving their heaters to and from the show, and the special credits in the form of attendance prizes that each allowed on the purchase of their particular heater. All advertising and publicity matter was paid for by the company. Licensed master plumbers made the necessary hook-up of the heaters without any charge to the dealers.

In addition to the special features of the show such as the geyser, fountains, etc., designed to attract the crowd, attendance prizes totaling approximately \$1,000 were awarded. These were in the form of credits to apply on the purchase price of a water heater. During each day of the show one or more dealers were allowed to feature their particular heater by awarding credits as attendance prizes. Further, a general attendance prize for the entire show of one water heater was awarded. Each person attending was furnished a registration card, and given a chance to participate in the prize awards. In addition to the fact that the prizes tended to stimulate at-



A Newspaper Advertisement Tells Story of Water Heating

tendance, they also furnished good sales prospects.

In order to create added interest in the show, and to further awaken a consciousness of the value of automatic water heating, special programs were conducted in the company's auditorium on the eighth floor of the building. These consisted of daily lectures by national and local domestic science and health experts who spoke on the value of hot water from the standpoint of convenience and health. There were also lectures by water heater dealers who demonstrated the proper use and care of water heaters in order to get the maximum efficiency and economy from their use. In addition, an entertaining two-act play entitled "Getting Hot," written, directed and staged entirely by Public Service employees, attracted considerable attention.

As a further stimulant for attendance of these special programs on the eighth floor, three ornamental electric lamps were awarded as attendance prizes after each program, and a bath towel was given to each person who attended and registered.

Practically all means of publicity at the company's disposal were used in advertising the show. Twelve thousand lines of display advertisements were released in the daily newspapers. Considerable time and care was given to the production of these advertisements. The teaser idea, always effective in advertising of this kind, was employed. A replica of "Old Faithful" was shown with a question mark, to arouse curiosity, and the promise that an explanation would soon be forthcoming, caused the public to be on the look-out for something unusual.

Other means of publicity employed were two large interchangeable letter electric signs, which were used the week before and the week of the show: Street car cards were placed in the front and rear of all street cars during the show; and a special street railway bulletin, with a circulation of approximately 100,000 per week, was dedicated almost entirely to the promotion of the show; 15,000 pamphlets distributed to housewives by bill deliverers of the company were used for this purpose. In addition about

4,000 direct mail invitations were sent to contractors, architects, prominent landlords, and other outstanding people of the city.

The attendance and general interest manifested in the show, the number of prospects secured and sales already consummated, exceeded the expectations of both the company and water heater dealers. Three days of unusually rainy and gloomy weather undoubtedly lowered the attendance considerably, but, an attendance of better than 25,000 for the first water heater show was considered creditable indeed.

Needless to say, from the registration cards both on the main display floor and the eighth floor, and from the discussion of the dealers with visitors to the show, a large number of live prospects was secured which will develop into future sales. The beneficial effects of the show in the way of sales will be reflected over a period of several months.

The show was staged under the general supervision of the Commercial Department, headed by W. E. Clement, with E. N. Avegno actively in charge. The creation of the geyser, fountains, window displays and decorative effects was achieved by H. M. Muller, and was the subject of favorable comment. Members of the Women's committee, headed by Miss Bess Pique, rendered valuable service during the show, through acting as hostesses during the evening.

The water heater dealers who cooperated in the Show were: Crane-Premier Company, J. D. Torreyson; Hoffman Heater Company, John Mahner; Humphrey-Ruud Water Heating Company, H. D. Miller; Southern Heater Company, Ever-Hot Heaters, E. D. Pearson; Pittsburgh Water Heater Company, P. J. Murphy; Standard Sanitary Manufacturing Company, Ideal-Hotcoil Heaters, J. H. Fremaux; and the Gas Appliance Company, Koil-less Heaters, W. E. Baker.

Licensed master plumbers cooperating in the show were represented by a committee composed of A. H. Kussman, chairman; L. C. deLeon, P. M. Kenney, E. M. Babst, and Marcus Korn.

"I am very highly gratified over the success of our First Annual Water Heater Show," Mr. Avegno said. "It not only has resulted in awakening a much greater consciousness of the value of automatic water heaters on the part of the public, and furnished the dealers with a large number of live prospects, but it has gone further towards cementing the spirit of good will and cooperation between the company, the licensed master plumbers and water heater dealers, which is so essential to our mutual success. I feel that the success has been so pronounced that an annual water heater show will become an institution of the company.

"In order to cash in to the greatest extent on the interest aroused at this time, a special sixty day campaign was inaugurated featuring the installation of water heaters for \$1 down and twenty-four months to pay the balance. Purchases may be made either from the licensed master plumber, water heater dealers, or Public Service, and the installments, if the purchaser wishes, carried on the gas bill. More than 650 water heaters were sold from July 1 to July 27.

"The Water Heater Show was merely a part of the cooperative plan which has been in effect between the water heater dealers, licensed master plumbers and Public Service for some time. Under these arrangements all water heaters are displayed on the sales floor of the company without cost to the dealer, and purchases may be made of any make or model on the sales floor of Public Service. Suitable arrangements have been worked out with the licensed master plumbers for the installation of heaters."

Natural Gas Dept. In New Offices

EFFECTIVE September 10, offices of the Natural Gas Department, American Gas Association, will be moved from the Allen Building to 709 Dallas Gas Building, Dallas, Texas, where adequate space has been provided for the transaction of a steadily increasing amount of business.

New Use for Gas Emerging from A. G. A. House-Cooling Research

RESearch and development work in house cooling and summer air conditioning, which the Committee on Industrial Gas Research, under the leadership of F. J. Rutledge, as chairman, has been conducting for more than two years and which has culminated in field tests this summer has begun to bear fruit in a definite manner.

While it was thought by many engineers that gas eventually would be employed in this field, no definite steps were taken until the summer of 1929 when the committee cooperated in experiments that proved discouraging at the time, but which subsequently turned out to be the basis on which the present successful attempts are based.

When the culminative work of the committee and its research workers reached the point where actual field tests were ready to be undertaken and announcement was made to the engineering profession, it acted like a spark being applied to the pent up enthusiasm for the subject on the part of the entire heating, ventilating and gas industries. Following the presentation of the subject at the convention of the Natural Gas Department, American Gas Association, last May, in Memphis, Tenn., there has been continuous discussion in building, heating, ventilating, refrigeration, gas and equipment circles, and in the business and financial press. That the development is considered to be one of first importance is generally recognized.

Since the work was publicly announced the committee has had the gratification of seeing many organizations undertake development of gas cooling and summer air conditioning processes and equipment. These efforts will all contribute toward bringing this desired household convenience within reach of the general public at

an early date and will thereby greatly benefit the entire gas industry.

The Committee on Industrial Gas Research has publicly stated on several occasions that there were a number of processes possible whereby gas can be used for this service. As none of them had been developed, it actively undertook to bring to a practical stage the system that was farthest advanced and which could be perfected in the shortest possible time. This system is based on the properties of an adsorbent material known as Silica Gel. In developing the Silica Gel system an entirely new conception of how summer air conditioning can be done was forcibly presented to the engineering profession and this has caused considerable discussion among engineers, as well as serving to call attention to the peculiar merits of gas for this service.

Following the projecting of its first efforts into the field, the committee's workers have been busy in connection with the other promising system of summer air conditioning. This is based upon the use of refrigerating only and the work has progressed to the point where simplified safe Silica Gel refrigerating equipment suitable for exacting air conditioning service is nearly ready for field tests.

The gas summer air conditioning ball has been given the start it needed. It will never stop rolling. How fast and how far it will go will depend upon the combined efforts of all who have put their efforts into this work. Out of it is emerging a new use for gas that is the first practical answer to the problem of how to help fill in the summer valley caused by the growing winter house heating peak.

Press comments throughout the country clearly indicate the importance which industrial and home economics leaders attach to the entrance of gas

into the home for house cooling and summer air conditioning.

The *New York Evening Post* published a copyrighted story on the work of the American Gas Association in this field and another was released by the Associated Press. The *New York Journal of Commerce* commented favorably on the subject and the general tone of dozens of other papers was the same. In the scientific and technical press, probably no subject on gas utilization has been discussed more. Many letters, emphasizing certain points have been received by the editors of these journals from their readers.

The weather during July and August was ideal for testing gas-operated summer air conditioning equipment. Two of the test installations sponsored by the committee have been operating steadily during that period and valuable data and operating experience is being gained, which will be made available to the entire industry, as soon as possible.

Sir Francis Goodenough Leaves London Company

SIR FRANCIS GOODENOUGH brought his forty-three years' official connection with The Gas Light and Coke Company, London, England, to a close on June 30, when, upon his retirement to devote himself to his other activities both inside and outside the gas industry, he handed over his duties as controller of the gas sales department to Stephen Lacey, who was his deputy for eight years. The gas sales department was founded as a recognized branch of the company's organization twenty-eight years ago, under the management of Sir Francis (then Mr. F. W.) Goodenough.

Sir Francis is continuing his other public work, including particularly the executive chairmanship of the British Commercial Gas Association, the chairmanship of the Government Committee on Education for Salesmanship and the presidency of the Sales Managers' Association.

Widening the Network Of Gas Mains*



W. J. Welsh

THE furnishing of gas service to localities and areas not presently supplied with gas is generally regarded as an important improvement. Of course, the cost of the improvement and the fixed charges are inescapable. In cases of similar improvements, such as water mains and sewer facilities, which are ordinarily provided by a municipality, the cost of the improvement is assessed against the property deemed to be benefited, whether locally or generally over the borough or city.

So, in the case of an extension of gas mains by a gas company, the investment and carrying charges thereon must be paid for through the rates for the gas consumed by the customers in the locality to which the extension is made, or must be borne by the consumers at large. In areas which are sparsely settled, the amount of gas consumed would not yield revenue in excess of the operating expense to meet the carrying charges, and, as it would be unfair to the other consumers to burden them with a deficiency or loss from the service, it is reasonable that those who are immediately and directly benefited would themselves bear the burden.

The practice of a public utility is, however, different from that of a municipality in analogous situations. When the local residents who are benefited by a public improvement have paid for it through assessment, they have no way of recouping their payments except on the theory of benefit.

In the case of a gas main extension, it is now generally the practice of the

By WILLIAM J. WELSH,
Treasurer, American Gas Association

public utility to refund to consumers the cost of the improvement as fast as the business develops to warrant the assumption of the investment by the gas company and the payment of the fixed charges through rates for gas consumed. However, our experience shows that in such cases, a gas company usually takes over the burden of the investment much sooner than business develops to sustain the investment.

There are two different situations for gas main extensions under the New York law: One where the building to which the extension is to be made is within 100 feet of the company's main, and the other where the building is more than 100 feet from the company's main.

In the first case, where the building is within 100 feet of the gas company's mains appropriate to the service requested, the company, upon written application by the owner or occupant of the building, makes the service extension from its main to the premises of the customer without any charge to the customer. The 100 feet requirement is embodied in the Transportation Corporation Law, Section 12. The theory of the law seems to be that gas service would be compensatory in the case of a new customer whose building is within 100 feet of the company's existing main.

In the second case, where the building is more than 100 feet from the existing gas main, the company is guided by the rule of reasonableness, which is, in fact, embodied in the Public Service Law. This company has a provision in its tariff schedule, on file with the Public Service Commission and therefore, controlling, as follows:

"If the premises of the applicant are located 100 feet or more from the nearest existing distribution main of the company, the making of the extension will depend upon the conditions obtaining in the particular case. An advance deposit

by the applicant will be required, to cover the additional investment required to make the extension of mains to serve such applicant; such sum so deposited to be refunded to such applicant according as new consumer upon such extended main are secured who may be connected therewith by a simple service. Where only a temporary installation can be made because the street is not yet at grade, the cost of such temporary installation and of the relocating of the mains will not be refunded."

In considering groups of structures we usually consider that the applicants are entitled to service where the average shows one consumer per 100 feet of main, even though none of them closely approximate a distance of 100 feet from the end of our existing main. Such an extension we feel meets the requirements for making reasonable extensions.

Other factors which the company considers, where prospective extensions show a sufficient density of structures to justify a gas main extension, are the regulation and grade of streets. In many instances there are two or three feet of fill, or corresponding cuts, and in others, no-well defined street lines.

Each year the company prepares a construction program of jobs to include the extensions in its gas main system to localities not already served with gas. Such extensions are made on the company's initiative, at its own cost, but services from the gas main to individual consumers' premises are not installed or connected up until proper application is made by the consumer.

The liberality of the company's policy is best indicated by a comparison of the mileage of sewers and gas mains on Staten Island. On December 31, 1930, there existed in the five wards of the Borough of Richmond 191.4 miles of sewers. In the four wards supplied by gas (excluding the Fifth ward) there existed on the same day, 263.5 miles of gas mains. In

(Continued on page 420)

* This article was contributed to the "Staten Island (N. Y.) Advance" on July 27, 1931, by Mr. Welsh, who is president of the New York and Richmond Gas Co.

Here Are Some Facts About "Small" Gas Bills*

ALL privileges, including franchise privileges, carry certain obligations and responsibilities. Our company, by its franchise, is privileged to be the sole purveyor of gas to the citizens of Chicago. It is therefore obligated to serve every citizen who wants gas-service, provided he is within reasonable distance of our mains, and no matter whether he needs gas in large quantities, or merely needs enough for a kitchenette breakfast, a cigar lighter, a jeweller's torch, a dentist's blow-pipe, or a glue pot.

Reason For Rates

These circumstances—the wide variance in amount of gas used by various classes of customers—complicates the job of working out equitable rate-schedules for all classes of customers. For it is obvious that many items in gas-service costs, besides the cost of the gas itself, have to be covered by the rates.

"Small" Users

The average domestic customer in Chicago uses only about 2,500 cubic feet of gas, or approximately 13 therms, per month. But there are 436,000 customers whose average use of gas is only 2,000 cubic feet a month or less, which means a monthly bill of \$2.04 or less down to 60 cents. And there are 167,000, who use only 1,000 cubic feet a month or less, with gas bills correspondingly small, down to 60 cents a month. All of these customers get the same prompt service, the same advantages, as do those who use ten thousand, or a million, or several million cubic feet a month.

Service Big Item

It costs just as much to read the meter, collect the bill and keep the ledger account of a small customer as it does of a large one. And there are

still other costs, besides the cost of the gas itself, which have to be taken into account in working out equitable rates for all classes of customers. As a matter of fact, the cost of the gas itself is the smaller part of the cost of gas-service. Over eighty per cent of our payroll goes for those other costs that are not included in the cost of producing the gas itself.

The items that make up the total cost of supplying gas-service fall naturally into three groups. They are commonly called: Production Demand Costs, Distribution Demand Costs and Customer Costs. All of these costs have to be incurred for the smallest as well as for the largest users of gas. And in proportion to the amount of gas they use, the smaller users are much the more costly to serve.

Huge Investments

Take Production Demand Costs. There is the large investment in plants for making gas, on which the interest has to be paid whether the plants are working full time, half time or not at all. Obviously, the more nearly to full time the plant can be kept working, the lower the cost *per thousand* of the gas they make. When they are not working, they are like the horse standing in the stall and "eating its head off." The larger users of gas tend to keep the plants working more steadily—more hours of the 24-hour day. The lesser users, like so many of the domestic customers, and all of the really "small" customers, want gas only a small part of the day, or once in a while for convenience. But the plants *must be ready* to supply their *maximum demand*, as when nearly 800,000 households begin getting meals *all at the same time*. Then there are maintenance, depreciation and "standby" costs to swell the total.

Must Be Ready

So with Distribution Demand Costs. Apart from the production

plants, the investment in pumping stations, gas holders, feeder mains, distribution mains, etc., with all the expense of keeping them in good order, has to be large enough to meet *the maximum demand* for gas, although this maximum demand may exist perhaps only thirty-six hours in three hundred and sixty-five days. Here again, the cost of providing for the smaller users of gas is relatively or proportionately higher than the cost of providing for the larger users.

What Customers "Cost"

Then "Customer Costs"—the expense of installing, removing, testing and repairing meters, as well as the expense of reading every customer's meter once a month, keeping an account with every customer, and delivering and collecting the bill. As said before, it costs as much to do most of those things for a user of 500 cubic feet per month as it does for the user of 5,000,000 cubic feet per month. Even if the gas itself costs nothing, the Distribution Demand Costs and Customer Costs would still remain, and they amount to more than the cost of producing the gas itself.

Why Minimum Charge

With these facts in mind, it must be clear to any one why there has to be a minimum monthly bill of 60 cents (including 400 cubic feet of gas or approximately two therms) to cover some of the expense of serving the smaller users. It is analogous to the taxicab waiting-time charge, or the initial charge registered when the taxi-trip starts; or the charge most banks make for keeping your checking account, when your monthly balance falls below a certain figure. The chances are that none of the big stores would let you have a charge account if you bought only one or two dollars' worth of merchandise a month and always had it charged and delivered.

(Continued on page 420)

* Reprinted from "Peoples Gas News," published by and for employees of The People's Gas Light and Coke Company, Chicago, Ill.

Courtesy in Customer Contact*

IN submitting the following suggestions to our employees, the management desires it to be understood that these printed remarks are not made in a spirit of criticism of any incidents of omission or commission, but solely that employees may become better informed of the Company's policy in the very important matter of Customer Relations, and by reading this pamphlet frequently, keep themselves thoroughly informed on the subject.

The customer's attitude and impression of the Company are formed almost entirely by direct contact with you, or by correspondence he may have with some one in our various departments. It is thus vitally necessary that this attitude and impression should receive the closest possible attention from each one of us.

Application Department

A new customer's first contact is with our Application Department. Here, the attitude of the person serving the customer is highly important. No one likes to wait, particularly applicants for service from a public utility. Promptness and cheerfulness are required above all else. The necessity for a deposit, when satisfactory credit information is lacking, can be explained to the customer tactfully, not abruptly, together with the required information that interest will be paid and a refund made at the end of a year if all bills are paid promptly. The clerk attending the customer should, invariably, thank the customer for the application; the manner of so doing will be referred to later.

Customers' Service Department

The customer's next point of contact will probably be with the service man who calls to execute the order for our service. Here again, promptness is important, and if an appointment has been made for a definite day, hour, or both, such arrangements should be rigidly carried out.

Great stress should be laid on the important part the service man plays in checking the name and address on the order and properly putting the correct reading of the meter on the order *while he is on the customer's premises*. This last statement must be faithfully executed, as any error at this point of contact is one of the most annoying to both customers and Company. It is an error that happens too frequently. An incorrect reading goes to the Bookkeeping Department, bills are sent out for wrong amounts, and the customer comes in or telephones to the office, requiring the loss of his time, the telephone operator's time, the bookkeeper's time, and the investigator's time—all to straighten out an error that should never have occurred in the first place. And the Company also suffers from the loss of the customer's good opinion.

The customer undoubtedly will have further contact with the Customers' Service Department when his appliances need attention or when troubles arise which, to him, require prompt attention. The need of satisfying the customer must be always paramount in the mind of the service man. Sometimes it is necessary to refer the order to some other department for final execution, but such reference should be carefully endorsed on the order and the reason for it fully explained to the customer. Additional and duplicate calls are frequently aggravating and should be avoided where possible. The foregoing applies with equal force to Installation Men or Fitters.

Main and Supply Department

It is sometimes necessary, due to main and supply work, to discontinue temporarily the gas supply to one or more houses on a street. When such a case arises the gang foreman should make certain that customers are properly notified in advance, and that the reason for discontinuance is explained, as well as the approximate length of time customers will be without our service. If it is necessary to enter the premises, the men should be particu-

larly careful to remove soil from their shoes before entering.

Meter Reading Department

The next direct contact the customer has, will probably be with the meter reader, although it frequently happens that the customer does not see the meter reader. He surely sees his bill, however, and the importance of correct indexing is obvious. The manner in which the meter reader gains admittance and leaves the premises must not annoy the customers; although meter readers necessarily move quickly, nevertheless questions asked by customers should be answered whenever possible by the reader. Otherwise, he should make out a slip provided for that purpose and turn it in to his foreman at the end of his day's work. If a customer complains of any odor of gas, however, such a complaint *must be telephoned immediately* to his foreman.

Collection Department

The Collector, as a customer contact man, obviously occupies a position with potential opportunities for making or marring good customer relations. Much depends on the Collector, not only in appearance and attitude, but in his knowledge of human nature. Under our present collection system, by which a Collector is assigned to a definite district and is responsible for all matters pertaining to collections in that district, he has a splendid opportunity for service, both to customers and Company. He can not only become better acquainted with our customers in his district, but should be able to inform himself of their financial responsibility. Such information, in many instances, will be of great help to the Credit and Sales Departments.

The Collector should know the policy of the Company in matters of collection—which, primarily, is to give our customers every consideration in the matter of payment. This policy does not mean being too lenient, but simply recognizes the fact that the

* Booklet published by Boston Consolidated Gas Co., Boston, Mass.

very large majority of our customers are honest in their intent to meet their obligations, although at times some customers may be temporarily embarrassed financially.

The Collector should be in a position to recognize such cases when they arise and to be tactful in handling these customers. When there is any doubt in his mind as to how to handle some specific case, he must also realize that the final decision rests with his Superintendent.

Customers' Accounting Department

While the customer may not come in direct personal contact with the Customers' Accounting Department, this is another instance of contact through his gas bill. The need of accuracy in the various steps required from the personnel of that department is self-evident. This department has various points of contact with the customer through such departments as Meter Reading, Collection, Credit, Application, and Investigation. It must, therefore, be realized that Customers' Accounting is an important cog in our operating machinery in its relation to customer contact, and the various steps from the first entry of the name and address to the final bill, demand accuracy on the part of the bookkeeper. The fact is recognized that we are all human, and errors will be made, but there must be a minimum; to repeat the same error is inexcusable.

Most of our bills are paid over the counter, and this contact point, for all its apparent simplicity, is quite important. Payment of bills can hardly be called pleasant; therefore, a cheerful, sunny disposition is required of all tellers. A teller's task is largely routine, but the payment of a bill by an individual is not routine and it is the positive duty of the teller to treat each individual customer as though that customer were the only one at his window that day. Here is where the manner and method of thanking the customer apply with particular force: It must not be done in a gruff, short, routine manner; it must be done cheerfully, in a clear, pleasant tone of voice. This matter is of great importance, and compliance with this rule—which applies not only to tellers, but to all

other employees having customer contacts—will be insisted upon.

Investigation Department

Customers sometimes feel that their bills are too high, or that proper attention has not been given them in service. They call on the Investigation Department for help. The work of this department requires patience, tact, and courtesy to the customers, as well as cooperation from other departments to respond quickly when called on for information. Many cases are handled by correspondence, but many more are visited and adjusted personally by the Investigation Department. Answering high bill complaints by letter is seldom a satisfactory way of adjustment; and if a customer expresses further dissatisfaction on receipt of a letter in trying to adjust any complaint, no further attempt at satisfying a customer should be attempted by correspondence. The subject of correspondence will be discussed further on.

Telephone

ORDER TABLE

One of the key-positions of customer contact is the telephone, or information order table. At our switchboard all incoming telephone calls that are not for some specific person are transferred to the order table. This order table handles an average of 250 calls a day, and these calls have to do with an endless variety of subjects pertaining to customers' service. Some of the calls can be answered immediately; others require investigation in other departments so that the operator can give the customer an intelligent answer. It is thus imperative for departments called on to give the required information without delay, in order that customers' inquiries may be promptly and satisfactorily answered.

GENERAL

At this point we reprint a general order issued some time ago in respect to answering telephone calls:

When an individual calls this Company on a trunk line, the switchboard operator answers, "Gas Company"; if the call is switched to the Order Table, the answer should be, "Order Table, Smith speaking"; or, if the call is for an individual, the answer should be "Jones speaking" or "Miss Brown speaking."

If the individual called is out or otherwise engaged and the call is answered by some other person, first state that fact and then request the name and telephone number of the person calling, so that the person called may complete the call on his return.

Such methods of answering calls are not only courteous but also speed up the service and individualize the Company in the minds of our customers.

In an age of telephone communication, it is very difficult for a large corporation to avoid customer dissatisfaction unless the individuals answering telephone calls identify themselves by name in the manner shown. Switching a customer from one department to another for information is another cause of serious complaint. The customer makes some request that, to him, may seem a simple matter, but he may not have made his request in such a way that he gets connected with the proper department. It therefore devolves on the person getting the call in the first place to be sure that the call is transferred promptly, not only to the proper department but to the person in that department who can correctly answer the customer.

This shows the necessity of customer contact employees informing themselves on departmental operation throughout the Company, not necessarily in detail, but sufficiently so that they may know to whom to refer customers.

There is a correct and an incorrect method of making a telephone call. The correct way, and it is the method we insist upon, is for the person making the call to put it through himself and not request some one else to make the call and then have the person called hold the line until the originator of the call is ready to talk. It is not only exasperating, it is discourteous; the time of the person called is as valuable as your own, perhaps more so, and one can realize how the person called feels when answering the telephone to be requested to: "Hold the line please, Mr. So-and-so is calling." Such cases are about as annoying as it is to call some one and have a voice say, "Who is calling?" The methods described are met with frequently, but

are not desirable from the standpoint of good customer relations, and will not be countenanced.

Correspondence

The subject of correspondence is one that has engaged the thought of many prominent business men the last few years, in order to get away from the stilted phraseology in writing letters known as "business lingo." Put personality into letters, but avoid as much as possible the use of the pronouns "I" and "We," being particularly careful not to use these pronouns in commencing paragraphs.

Try to write as you would talk to the customer if he were sitting at your desk. A large majority of our customers do not, on the average, receive a letter a day; to them a letter thus becomes an important matter, particularly if it is in answer to a complaint. Employees writing to customers should try to put themselves in the minds of the customers and think of what the customers' reaction is going to be when they receive the letters.

Good correspondence is not an easy matter and will require thought and practice. There have been many pamphlets published in the last few years on the subject of Business Correspondence. One of the best is that issued by the Bureau of Commercial and Industrial Affairs of the Boston Chamber of Commerce. It is suggested that employees whose position requires them to write to customers make requisition on our Purchasing Agent for a copy of this pamphlet.

Sales

The operations of the Sales Department will not be referred to at length, but employees of that department can profitably study this booklet and so familiarize themselves with the information it gives that they can intelligently answer customers' inquiries. All of us are salesmen, whether we are selling service or appliances that give service to our customers. Those of us who do not come in direct contact with customers can so fulfill our responsibilities that the service the Company desires to render its customers will be as nearly perfect as humanly possible.

Avoid Friction

Employees must entirely avoid arguments with customers. Such tactics accomplish nothing and in the end almost invariably arouse a spirit of antagonism in the customer. Another thing to avoid in customer contact is talking unnecessarily; be respectful and answer questions pertaining to our business, but let it go at that. There is no necessity of talking of outside matters; but be certain, in answering questions pertaining to our business, that you are in a position to give CORRECT information. It is much better to say you do not know than to answer incorrectly. When it is necessary to say that you will have information sent, see to it that the proper person is requested to forward the information promptly.

The great value of harmonious relations among all employees and between each department must be stressed at all times. Jealousies, criticism of fellow-employees during or after working hours or within the hearing of customers, and lack of ready, willing cooperation between departments have no place in a utility serving the public—and will not be tolerated by the management.

Greet your fellow-employee cor-

dially, always, whether you meet him on the phone or in person. Acquire an understanding of the other fellow's job. Help him, or her, every chance you have.

Until a large corporation is functioning smoothly in each of its parts and pulling together at every turn, it is not able to perform its fullest service to its customers.

Conclusion

This Company, we may well say our Company, has been in existence over 100 years. It serves an area of over 305 square miles, supplying gas to 300,000 customers, and it has 2,000 employees. We have an organization that we are proud of, and every employee should feel proud in being connected with such an organization. Each of us should do everything in his, or her, power to further the best interests of the Company at all times, for by so doing, we further our own interests. As the Company prospers, all prosper.

A study of this booklet and a review of its contents, from time to time, will in the opinion of the management be of value in improving customer relations. It is published with that interest in mind.

American Radiator Acquires Gas Products Corp.

AMERICAN RADIATOR & STANDARD SANITARY CORP., through its radiator and boiler subsidiary, American Radiator Co., has acquired all the capital stock of American Gas Products Corp. In addition, its subsidiary, the Campbell Metal Window Corp., has effected an affiliation with the Maxim Silencer Co., of Hartford, Conn., to manufacture and distribute a room silencer device to be known as the Maxim-Campbell Silencer and Air Filter Unit.

The acquisition of American Gas Products Corp. represents a further step in Radiator's program involving the manufacture and sale of a complete line of gas-fired equipment for the heating and plumbing trade, and also public utilities.

The sale of this type of equipment, particularly by utilities, has increased greatly and Radiator company officials express the belief that there are profitable possibilities for a strong company to take a dominant position in that fast growing line of industry.

American Radiator already manufactures gas boilers, gas radiators and gas hot water heaters for domestic use. A

line of gas ranges will soon be in production. Fox Furnace Co., a Radiator subsidiary, is introducing a gas-fired furnace for heating and air-conditioning of homes. Detroit Lubricator Co., another subsidiary, manufactures regulators and controls for various types of gas burning equipment.

Miss Althea Lepper Succeeds Miss Wagner

MISS Althea Lepper has been appointed director of the home service division of the Consolidated Gas Company of New York, New York, N. Y., according to an announcement made by Oscar H. Fogg, vice-president in charge of commercial relations. She takes the place of Miss Jane T. Wagner, resigned.

Miss Lepper is one of the few women in the country who have college degrees in engineering. She attended Ohio State University, at Columbus, Ohio, and majored in geology. After graduation she became a member of the staff of the American Museum of Natural History, in New York City, working with the curator of geology on various fuel research problems.

Manufacturers To Meet Annual Meeting, September 17-18

Will Discuss Mutual Problems
Appliance and Equipment



Scene of Manufacturers' Convention—Book-Cadillac Hotel, Detroit, Mich., and E. S. Dickey, Chairman of Section.



EYES of the makers of gas appliances and equipment are turned toward Detroit, Mich., where the annual meeting of the Manufacturers' Section, American Gas Association, will open on Thursday, September 17, and continue through Friday. All sessions will take place at the Book-Cadillac Hotel, and advance reservations indicate that there will be an attendance of about 200 manufacturers.

According to Colonel E. S. Dickey, chairman of the Manufacturers' Section, problems confronting the manufacturer members will be discussed from all angles by men who are leaders in their fields.

Some of the more important topics which will be presented are as follows:

"How the Cross-Licensing of Patents will Help Us to Make Them Assets Rather than Liabilities"; "How will the Adoption of Sound Standards of Business Practice Help Us To Realize a Fair Return on Our Investment?" "Financing of Dealer Sales"; "What Will the Development of Sound Statistics Reflect in an Accurate Picture of 'What's What' in Our Industry?"

Executives of the American Gas Association will be on hand to take part in the proceedings of the manufacturers on the first day. Clifford E. Paige, president, will present a paper on "Can the Association Help the Manufacturer?" R. W. Gallagher, vice-president, will speak on "The Need for a Coordination of Our Industry as a Whole." "Why the Development of Our New Activities," will be the subject of an address by Alexander Forward, Managing Director.

The second day will be devoted to divisional meetings.

Details of the program have been worked out by Colonel Dickey, assisted by the vice-chairmen of the section—David F. Kahn and W. E. Steinwedell. Others cooperating to make the meeting a success are as follows:

Range Division

W. FRANK ROBERTS, chairman and W. S. SMITH, vice-chairman.

Standards of Practice Committee—STANLEY GRADY, chairman.

Cross Licensing of Patents Committee—P. R. TAPPAN, chairman.

Safety Ordinance Committee—CARL F. HOFFSTETTER, chairman.

Water Heater Division

HARTLEY WALKER, chairman and LEO FRIEDMAN, vice-chairman.

Standards of Practice Committee—SCOTT FOWLER, chairman.

Cross Licensing of Patents Committee—FRANK W. SHUELL, chairman.

Space Heater Division

GEORGE A. HUMPHREY, chairman and FRANK H. ADAMS, vice-chairman.

Standards of Practice Committee—CARL E. FROELICH, chairman.

Cross Licensing of Patents Committee—E. C. ADAMS, chairman.

Safety Ordinance Committee—W. L. SHARPE, chairman.

Following is a tentative outline of the program:

September 17

10:00 A.M. Call to Order—E. S. Dickey, chairman

10:05 A.M. Welcome to Detroit—John A. Fry, chairman Reception Committee

10:10 A.M. Response—David F. Kahn, vice-chairman, Manufacturers' Section

10:15 A.M. Address—The Chairman

10:25 A.M. Report of Secretary—C. W. Berghorn

10:35 A.M. Pass in Review—Philip O. Deitsch, Manager of Group Activities

March On Detroit For September 17 and 18

Problems in Gas
Equipment Fields

11:05 A.M. The Development of Association Activities—Alexander Forward, Managing Director, A. G. A.

11:20 A.M. The Co-ordination of Our Industry as a Whole—R. W. Gallagher, vice-president, A. G. A.

11:40 A.M. Address—Where to Now—Dr. Virgil Jordan, Economist, McGraw-Hill Publishing Co.

12:05 P.M. How Can We Assist the Dealer in the Merchandising of Appliances—Hubert Tappan, General Manager, Glenwood Range Co., Taunton, Mass.

12:20 P.M. The Utility Financing of Dealer Sales—E. R. Acker, chairman Commercial Section

12:40 P.M. Past, Present and Future of A. G. A. Statistics—Paul Ryan, Chief Statistician, A. G. A.

12:50 P.M. Announcement Report of Nominating Committee—Definite Election of Officers to be later confirmed by Sectional Meeting at Atlantic City in conformity with by-laws.

1:00 P.M. Luncheon—Main Ball Room
Address—H. Leigh Whitelaw—"An Analysis of Our New Organization"
Address—Edgar A. Guest

2:15 P.M. Recess—Golf, Canada, in short, contact with either Messrs. John A. Fry, Frank Shuell, T. E. Bullion, Al-



Vice-Chairmen
of Manufacturers'
Section.
Above—W. E.
Steinwedell.
Below—David
F. Kahn

vin Sherman, or Geo. Humphrey, the local "steering committee."

September 18 Range Division

10:00 A.M. Range Division Meeting

10:05 A.M. Call to Order—The chairman

10:15 A.M. Report of Cross Licensing of Patents Committee

10:30 A.M. Discussion

11:15 A.M. Report of Standards of Practice Committee

11:30 A.M. Discussion

12:15 P.M. Report of Safety Ordinance Committee

12:30 P.M. Discussion

12:45 P.M. Recess

AFTERNOON SESSION

2:00 P.M. Discussion—Do we want to engage in traffic work at this time?

2:20 P.M. New Business

2:45 P.M. Open Forum

3:15 P.M. Adjournment—Golf, etc.

The above outline of the Range Division program will be followed in substance by the Space Heater and Water Heater Divisions since each branch of the industry is considering the same basic policies.

In addition to the several subjects to be discussed by leaders of our industry will be an address by Dr. Virgil Jordan, formerly economist, National Industrial Conferences Board, chairman of the Conferences of Statisticians in Industries, and at present, economist, McGraw-Hill Publishing Company, and Editor of *Business Week*. Dr. Jordan is an economist who is blessed with the facility of soundly analyzing current conditions and at the same time keeping both feet solidly on the ground.

The feature of the luncheon program will be an address by Edgar A. Guest, poet and philosopher. Mr. Guest will be introduced by H. Leigh Whitelaw, past-chairman of the Manufacturers' Section.

The second day of the meeting will be given over to a discussion of problems common to the appliance industries and each division will act separately on the adoption of, as one manufacturer put it, "common sense standards of doing business."

It might be logically expected that the Detroit conference will mark the start of a new era in the appliance manufacturing and equipment fields.

Industrial Gas Research in Scaling of Steel at Heat-Treating Temperatures

EARLY this year, under the auspices of the Committee on Industrial Gas Research of the American Gas Association, there was completed a research project designed to study the decarburization of steel at heat treating temperatures in furnaces using gas and other fuels. This project was carried through to completion by metallurgists of the Department of Engineering Research, University of Michigan. Results of this decarburization research project are summarized in a bulletin entitled "The Surface Decarburization of Steel at Heat-Treating Temperatures."

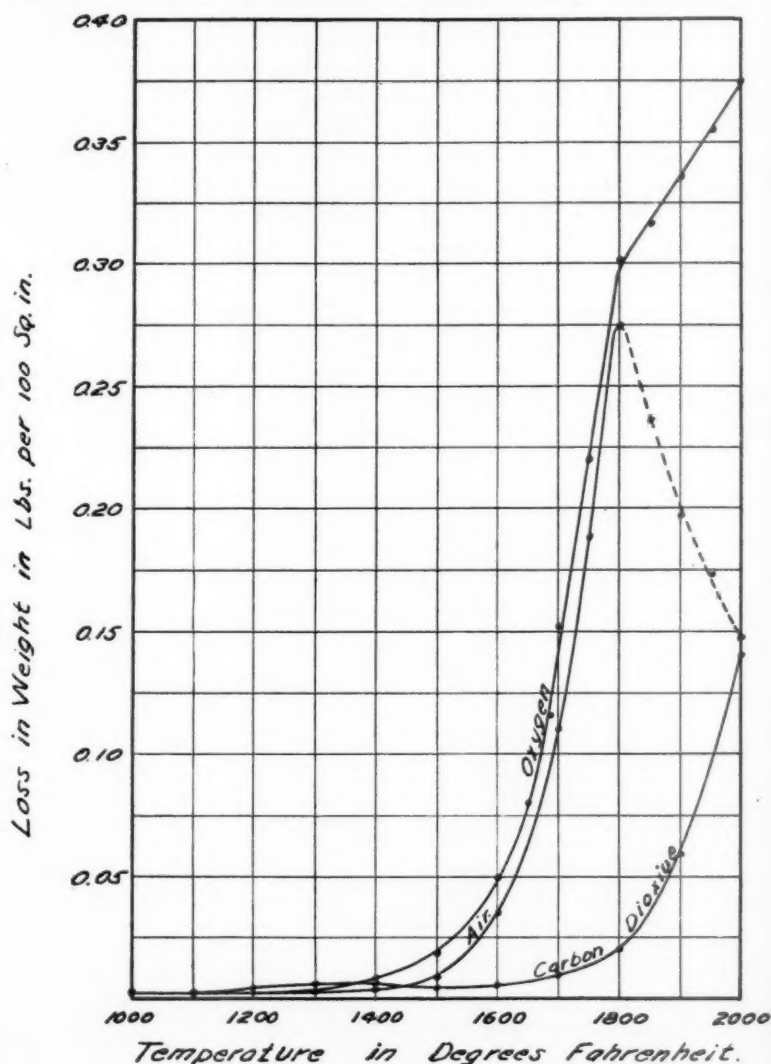
The question of scaling came up repeatedly in the study of decarburization and as the work proceeded the need for more definite information on the scaling of steel in the heat treating range became increasingly evident. As a consequence, the committee authorized an additional research project in this field and experimental work is now well under way.

The investigation is considering some twelve phases of the general problem of scaling, at heat treating temperatures and to a large degree is paralleling the work on scaling of steel at forging temperatures. The results of this work which were presented in part by Jominy and Murphy at the annual meeting of the American Society for Steel Treating held at Chicago in 1930, showed rather definitely that the scaling or non-scaling effects of any atmosphere used in the forging temperature range may be predicted from the composition of the products of combustion. The investigation is following the general procedure used at forging temperatures; it is considering first the relative scaling effects of individual gases or atmospheres such as carbon dioxide, oxygen, dry air, and water vapor on a low carbon

By CLAIR UPTEGROVE,
Professor of Chemical Engineering,
University of Michigan

steel and the effect of temperature, time, and rate of flow for each of these atmospheres. After the establishment of the relative scaling action

of the individual atmospheres and the effect of the variables, time, temperature, and rate of flow, the work can then be extended to include the effect of synthetic and natural mixtures of gases and the determination of non-scaling conditions. As the control of



Curves showing effect of temperature on scaling of steel

the furnace atmosphere may affect not only the amount of scale formed but also its physical characteristics, the investigation will include a study of the nature of the scale formed and the conditions favoring the formation of any particular type. In as much as the physical characteristics of one type of scale may cause it to adhere closely to the steel while those of another type may cause most of it to split off in a quenching operation, the determination of the conditions favoring the formation of the latter type of scale becomes of primary importance. Finally, the investigation will include the determination of the relative scaling characteristics of all of the commonly used steels.

In carrying out the experimental work the procedure which was developed by Jominy and Murphy for the work at forging temperatures has been followed in general. A $2\frac{1}{2}$ -in. length of polished .625-in. round 1015 S.A.E. steel is introduced into the furnace at the desired temperature and subjected to the scaling action of a given atmosphere for a given time and rate of flow. The sample is then

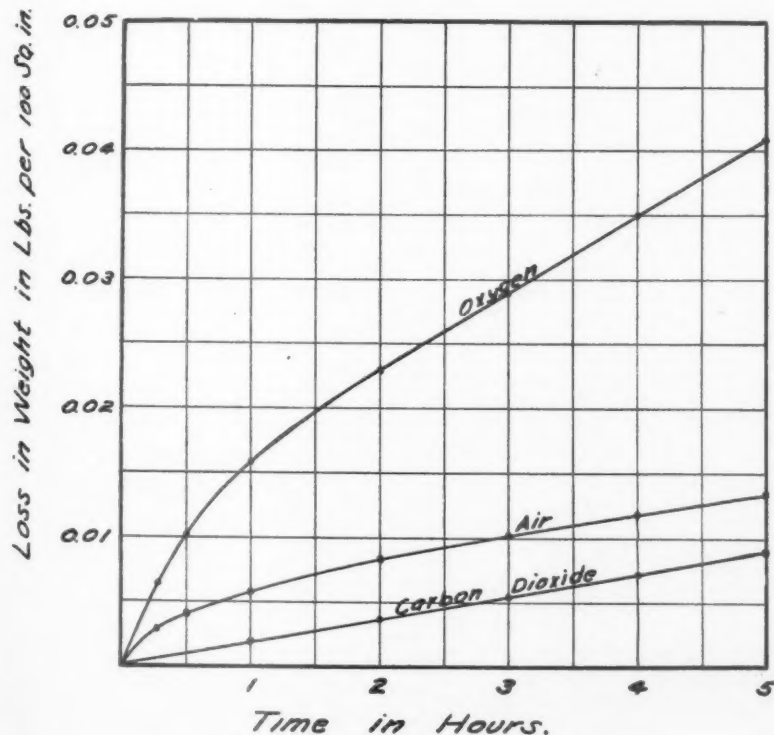
quenched in distilled water and the remaining scale removed by electrolytic pickling. In this way the weight of scale formed is obtained in pounds per 100 square inches of surface.

Some modifications of the procedure which was used at forging temperatures have been found necessary. While a 40-min. period at 2300° F. insured a sufficiently heavy scaling for comparative purposes, the lower temperatures of the heat-treating range demand a longer period to produce appreciable scaling. As a consequence, the time has been increased to two hours. Similarly, while at 2300° F. the possible effect of the moist air in the furnace at the time the sample was introduced and that entering at the end of the run as the sample was withdrawn could be ignored because of the very rapid scaling and the high rate of flow used (60 feet per minute), the slower rates of scaling in the heat-treating range necessitate the minimizing of this effect. This is accomplished by flushing out the furnace with dry nitrogen previous to the introduction of the sample and during the time it is coming to temperature.

At the end of the run, the gas whose effect is being determined is cut off and the furnace is again flushed with dry nitrogen while the sample is being withdrawn for quenching.

Up to the present time determinations have been made of the relative scaling effects on 1015 S.A.E. steel of atmospheres of carbon dioxide, oxygen, and air over the temperature range of 1000 to 2000° F. Determinations have been made of the effect of the time of exposure for periods from 15 minutes to 5 hours for atmospheres of oxygen, dry air, and carbon dioxide. The effect of varying rates of flow up to 30 ft. per minute and the effect of dilution with nitrogen have also been determined for an atmosphere of carbon dioxide.

While the extent of the work completed at this time is hardly sufficient to permit the drawing of any very definite conclusions in regard to scaling of steel in the heat-treating range, certain observations are of decided and practical interest. At temperatures below 1400° F. the rates of scaling are very low in atmospheres of carbon dioxide, oxygen, and dry air, the scale formed in any of these atmospheres for a 2-hour period and 30-foot-per-minute flow being less than .01 of a pound per 100 square inches. For temperatures above 1400 and below 1600° F. the rates of scaling in dry air and oxygen increase rapidly, the rate for oxygen at 1600° F. being approximately 8 times that at 1400° F. With carbon dioxide no appreciable increase occurs between 1400 and 1600° F., a minimum point making its appearance around 1500° F. Above 1600° F. the rate of scaling increases very rapidly for atmospheres of oxygen and air, but in carbon dioxide no rapid increase occurs until a temperature of 1800° F. is reached. At approximately 1800° F. blistering makes its appearance, and the rate of scaling for atmospheres of oxygen and air are appreciably retarded—in fact, in the case of air the rate of scaling is actually decreased for temperatures up to 2000° F. under the conditions which the test runs were made. The rate of flow was 30 feet per minute and the time of the test run was two hours. Tests made for shorter peri-



Curves showing effect of time on scaling of steel at 1520° F.

(Continued on page 420)

Personal and Otherwise



N. B. Terry

Norman B. Terry, of The Laclede Gas Light Company, St. Louis, Mo., won the "Missouri-Kansas-Texas Cup," one of four awarded annually by the Advertising Club of St. Louis for "outstanding service" in that organization.

R. C. Hoffman, Jr., vice-president of Southern Cities Public Service Corp., with headquarters in Atlanta, Ga., has been promoted to the executive staff of the Central Public Service Corp., with headquarters in Chicago, Ill.

William McCall has been promoted to shop foreman of the Bartlesville Gas & Electric Company, Bartlesville, Okla.

Col. John Stilwell, vice-president in charge of industrial relations, Consolidated Gas Company of New York, has been appointed vice-president and managing executive of the Green Mountain Lake Farms, Inc., the convalescent farm at Pawling, N. Y., which is maintained for the benefit of employees of the Consolidated and affiliated companies.

Arthur E. Dietrich, formerly associated with the Pittsburgh Coal Company, has become sales manager for the E. S. Adsit Coal Company. Mr. Dietrich has direct charge of the company's wholesale department.

M. J. O'Callahan has been appointed assistant to the general sales manager of the Consolidated Gas Company of New York. For the past four years Mr. O'Callahan has been manager of the domestic division of the sales department.



M. J. O'Callahan

E. F. Hobbs has been named superintendent of the Bartlesville Gas & Electric Company, Bartlesville, Okla. Mr. Hobbs succeeds the late T. F. Patterson.

W. F. Raber has been elected president of the San Diego Consolidated Gas & Electric Company, San Diego, Calif.

George Wittmer, of Pittsburgh, was the first prize winner of the Eighth Annual Golf Engineering Tournament held re-

cently at the Kalkwa Country Club, Erie, Pennsylvania, where about forty gas men met as the guests of Frank Payne and the Metric Metal Company.

Robert C. Coffey has been appointed manager of the eastern division of the Oklahoma Gas and Electric Company with headquarters in Muskogee. W. S. Van Sickle was elected to succeed Mr. Coffey as vice-president and general manager of the Mississippi Valley Power Company and the president of the Fort Smith Trac-tion Company.

Ray C. Finch, formerly director of domestic sales for the Seattle Gas Company, was recently appointed commercial manager of all properties of the Northwest Cities Gas Company, with headquarters at Walla Walla, Wash.

George H. Shaw, general counsel for the Public Service Company of Colorado, has been made general counsel for the Cities Service Company and the Henry L. Doherty interests in Kansas, Missouri, and Oklahoma.

Convention Calendar

American Chemical Society,
Petroleum Division,
Buffalo, N. Y.

August 30 to September 5.

Pacific Coast Gas Association,
San Francisco, Calif.

August 31 to September 5.

Empire State Gas & Electric Association,

The Sagamore, Bolton Landing,
Lake George, N. Y.

September 10 and 11.

Wisconsin Utilities Association,
Gas Section,
Sheboygan, Wis.

September 10 and 11.

Maryland Utilities Association,
The Vendabona Hotel,
Braddock Heights, Md.

September 11.

American Trade Association Executives,

Grove Park Inn,
Asheville, N. C.

September 23 to 26.

**Range, Water Heater, Space Heater,
Boiler and Miscellaneous Divisions, Manufacturers' Section, A. G. A.,**

Book-Cadillac Hotel,
Detroit, Mich.

September 17 and 18.

Wisconsin Utilities Association,
Women's Conference,
Northland Hotel,
Green Bay, Wis.

September 18.

Public Utilities Assn. of W. Va.,
Greenbrier Hotel
White Sulphur Springs, W. Va.

September 18 and 19.

New England Gas Association,
Operating Division,
Wendell Hotel,
Pittsfield, Mass.

September 18 and 19.

American Electric Railway Association,

Atlantic City, N. J.
September 26 to October 2.

Indiana Gas Association,
West Baden, Ind.

September 29 and 30.

Wisconsin Utilities Association,
Women's Conference,
Green Bay, Wis.

October 8 and 9.

American Gas Association,
Atlantic City, N. J.

October 12 to 16.

Nat'l Assn. of Railroad & Utilities Commissioners,
Richmond, Va.

October 20 to 23.

Wisconsin Utilities Association,
Commercial Section,
Hotel Lorraine,
Madison, Wis.

October 22 and 23.

Wisconsin Utilities Association,
Commercial Section,
Madison, Wis.

October 22 and 23.

American Petroleum Institute,
Stevens Hotel,
Chicago, Ill.

November 10 to 12.

Bituminous Coal Conference,
Pittsburgh, Pa.

November 16 to 21.

Utility Association Secretaries,
Milwaukee, Wis.

November 30 and December 1.

Heating and Ventilating Exposition,
Cleveland Auditorium,
Cleveland, Ohio.

January 25 to 29, 1932.

Home Service Activities

Women Use Gas Company's Quarters for Community Meetings



Katherine Rathbone

OUR home service department is not used the entire time for gas company activities so we decided to offer the auditorium and the kitchen to the women's groups in the Santa Monica Bay District for business meetings or social functions.

Our office building is centrally located and can be easily reached by street cars and busses, thus making it an ideal meeting place for the busy woman of today. We sent out invitations to the presidents or secretaries of all parent teacher associations, women's clubs of all kinds, and also to the different church organizations.

The auditorium is a large cheerful room with windows on two sides, which are beautifully draped, giving the room a home-like atmosphere. The auditorium will seat 250 nicely. If a card party is being planned, twenty-five to thirty tables may be arranged without crowding. The different groups may use this room without obligation on their part. We furnish for them chairs, card tables, linen table covers, dishes, silver, paper plates and paper napkins.

In selecting our chairs we chose a very substantial one of the folding type, made of walnut. The tables have a metal frame with a walnut finish, and the tops are a dark green moire fabrikoid. The tops to these tables may be renewed if at any time it is necessary. The metal table was slightly higher in cost than those made of wood, but was much more substantial. For covers to use when serving, we chose cream linen squares, 36 in. by 36 in., with a 2-in. hem. The silver service was only purchased in forks and spoons, and is a very neat, conservative design. The cups and saucers are in pastel shades, pale pink, yellow, and light green. The dishes and the silver are open stock and can be replenished or added to at any future date.

The plates were purchased in a glazed cardboard, in three colors matching the cups and saucers. The napkins we bought in the pastel shades, matching the china and the plates.

By KATHERINE RATHBONE,
Home Service Director, Southern Counties
Gas Co., Santa Monica, Calif.

The paper plates were chosen with the thought in mind that there would be less dishwashing when large groups were entertained. We found out that the cost of laundering linen napkins was rather high and that a good quality of paper napkin could be substituted and still carry out our color scheme.

The groups are limited to light refreshments such as sandwiches, cookies, cakes, ice cream, tea or coffee. We are not equipped to serve luncheons or dinners, but the groups may make tea or may use our urn for coffee. We do not furnish any of the food materials, and we do not take any of the responsibility for the party, but we are always in the auditorium and kitchens ready to assist in any way possible.

The tables and chairs are arranged by our boys before the entertainment and are taken care of afterward. The only request we make of the ladies is that they must wash the silver and dishes and replace them in the cupboards before leaving. There is no charge for the use of the building or for any of our equipment.

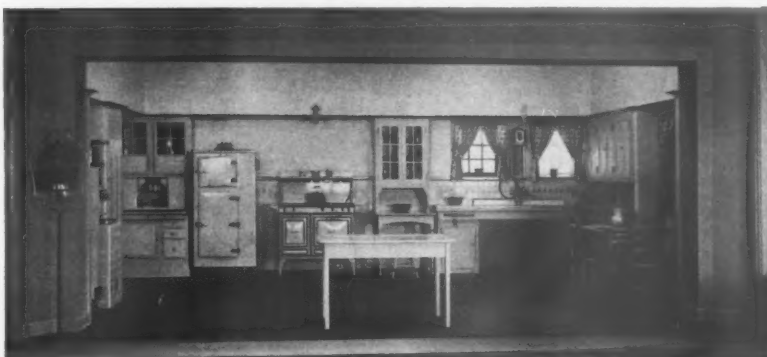
This feature of our department is quite new but we have had many lovely parties and evening entertainments. During the month of February over 800 women were entertained in the auditorium by the different civic organizations. Some of the groups who have regular weekly or

monthly meetings use our auditorium during the day or evening, they are on the regular schedule and the rooms are reserved for them on certain dates. We find that the ladies are very delighted with our plan and with the idea that they may have a desirable place without paying an exorbitant rent, for many of their affairs are in the nature of benefits.

One of the advantages gained from inviting groups to meet with us is the fact that they not only see and examine our new appliances, but they have the opportunity of using the appliances and proving to their own satisfaction that gas is always best. At the same time we have the opportunity of telling these groups of our home service department and we are making friends for the gas company and a good friend is always an asset to a public utility.

Our gas company building is located in the center of the downtown area, thus each activity conducted in our auditorium draws the women to the shopping center. We are not only satisfying our own desire by bringing the women to the gas company, but we are also performing a service for the merchants by getting the women into the shopping district.

We feel that this experiment has proven quite worth while and we draw our conclusions from the many letters of appreciation which we have received and from the many worth-while appliance sales, and from the many friends we have made, not only for the home service department, but for the entire gas company.



Home Service Kitchen, Southern Counties Gas Company, Santa Monica, Calif.

Testing Laboratory

R. M. CONNER, Director

MANAGING COMMITTEE

J. S. DEHART, JR., Chairman

N. T. SELLMAN, Secretary

Pacific Coast Branch Shows Rapid Progress

By F. R. WRIGHT,
Laboratory Publications Editor

AUGUST 3 marked the end of the first three months of activities of the Pacific Coast Branch of the A. G. A. Testing Laboratory. Although the Branch Laboratory was authorized by the Executive Board to proceed with full approval testing on May 2, this fact was not generally known among manufacturers of the Pacific Coast area until some time later. The first announcement of this fact appeared in trade papers in June. In spite of this, and the fact that there were still many details to be taken care of by way of completing arrangements for testing, there were four appliances tested for approval during May. In June this number increased to nineteen and on July 25 sixty-four appliances had been tested for approval. The total number of appliances approved by tests and inspection during this period amounted to eighty-nine. By the end of June, Pacific Coast manufacturers had filed applications for test on 154 appliances. This number was increased considerably during July.

The support being given to the Pacific Coast Branch Laboratory by manufacturers in that region is most gratifying, and it is expected that this will be even more marked as time goes on and general business conditions improve.

There are approximately 105 gas appliance manufacturers in the Pacific Coast region, the majority of which are members of the American Gas Association. Although a total of only twenty-three submitted appliances for approval during the first three months of the Branch Laboratory's activities it is confidently expected that the great majority, if not all, will eventually find it to their advantage to do so. During May alone four Pacific Coast manufacturers submitted water heaters for approval tests, which were the first appliances ever to have been consigned by these companies to the A. G. A. Testing Laboratory for approval. During June one other water heater company and one manufacturer of central heating gas appliances submitted appliances for approval tests for the first time, and in July the sixth water heater manufacturer with whom the Laboratory had no previous contact submitted appliances for tests.

Although a large number of applications for test on all the common types of domestic gas appliances have been filed the greatest activity seemed to be in connection with space heaters and furnaces.

A large number of the former were submitted for test during July. The 1,000 cu.ft. air-tight room for use in conducting space heater tests was completed in June. A new thermal conductivity air-gas ratio apparatus was also procured so that complete approval testing is proceeding on space heaters as rapidly as possible.

A Thomas Meter for use in conducting efficiency tests on warm air furnaces was shipped to the Pacific Coast Branch early last month so that complete approval testing of all warm air furnaces can be made. In all cases the same type of equipment is being used at both the Pacific Coast Branch and the main Laboratory in Cleveland.

The three test gases used at the Pacific Coast Branch have characteristics similar to those used at the Cleveland Laboratory. While a suitable supply of

natural gas for test purposes was readily obtainable in Los Angeles, some difficulty was at first encountered in securing the two kinds of manufactured gases prescribed in the A. G. A. Approval Requirements. However, provisions were finally made by which a supply of these gases, having the proper characteristics, could be obtained.

Both gas company and manufacturer executives in the Western Coast Territory have shown considerable enthusiasm about the Pacific Coast Branch Laboratory and through their cooperation have assisted greatly in its establishment. Many manufacturers in that territory who were heretofore unwilling to send their appliances to Cleveland for test have submitted them to the Los Angeles Laboratory. It is believed that all progressive manufacturers of gas appliances will eventually join in this program to increase the safety of their appliance and to improve the quality of gas service rendered to the public.

Field Inspection for Approval Renewal Starts this Month

By K. H. FLINT,
Chief Inspector, Testing Laboratory

IN order to complete all annual inspections for 1932 approval before January 1, the Laboratory inspectors will begin field inspections somewhat earlier this year than usual. This procedure is deemed advisable for the reason that many manufacturers are not in production during the last few weeks of the year due to the taking of inventories, which occasions delay in making inspections which have not been completed previously.

There are approximately 200 manufacturing plants to be inspected this year exclusive of about forty-five in the Pacific Coast region. The products of the eight manufacturers of approved flexible gas tubing will be inspected this month, while the inspection of appliances will begin about October 15. It is hoped that all annual inspections can be completed on or before the middle of December.

The inspection program will include a

careful check of all appliances listed as approved by the Laboratory. All appliances which are not inspected and those which are found to possess defects or be improperly constructed will be removed from the *List of Approved Appliances* and the approval on them revoked. In order for approval to be renewed for 1932 a satisfactory inspection of all appliances is essential, and such appliances must be found to conform to the Laboratory's record of the ones approved by test. This, of course, is in line with the Laboratory's customary procedure.

A slight modification has been made in the procedure relative to listing for 1932. Instead of issuing an entirely revised list on February 1, the new listing for each manufacturer will be included in the approval list in the next issue following the inspection, where time permits doing so, otherwise the revised listing will appear in the Approved List the next month following.

A new form of Approval Certificate has been adopted by the Association and

will be used in granting approvals for 1932. As pointed out in an article appearing in *The A. G. A. MONTHLY*, July issue, the new certificates are renewable from year-to-year for a period of ten years. This change was made primarily for the purpose of reducing inspection costs to manufacturers, a large part of which, in many cases was the cost of approval certificates. A new schedule of test fees has been approved by the Laboratory Managing Committee on account of this change. However, the new fees will not go into effect until next year since all certificates of approval will necessarily have to be reissued on the new certificate form this year.

It is planned to make a further change in inspection procedure during the coming year. It is advantageous to make factory inspections when manufacturers are in production on approved products. As the production peak, with most types of appliances, occurs some time other than during the last three months of the year, it is planned to make the inspection on the various types of appliances during the peak production periods rather than at a set time late in the year. This arrangement should make possible a more effective inspection of the manufacturers' products and, at the same time, equalize the Laboratory's inspection work throughout

the year rather than having the major part of the annual inspections fall within a short period of time.

The annual inspections require Laboratory inspectors to travel about 50,000 miles each year. Such activities take them as far east as the Province of New Brunswick, north in various parts of Canada, south to Birmingham, Alabama, and west in Oklahoma, Kansas and Nebraska. Inspectors from the Pacific Coast Branch Laboratory have to travel nearly the full length of the Pacific Coast, from Southern California to Portland, Oregon.

The value of the Laboratory's inspection program from the standpoint of insuring maintenance of properly constructed appliances for the use of the public, cannot be overemphasized. It also has many distinct advantages from the standpoint of the manufacturer, and at the same time assists the Laboratory to serve the large group of gas appliance manufacturers by becoming better acquainted with their needs through closer contact with them.

The hearty cooperation of manufacturers with our inspectors in the past has been the source of much satisfaction to the Laboratory management, and it is with pleasure that another annual inspection program is announced looking toward the renewal of pleasant contacts.

Developments In Preparing Approval Standards For Appliances

THE tentative requirements governing the installation of conversion burners, which were released to the industry for criticism about May 1, were reviewed by the subcommittee at a meeting held at the Testing Laboratory during the latter part of July. Several revisions were made as a result of the criticisms received and these requirements have been recommended to the A. G. A. Approval Requirements Committee (American Standards Association Sectional Committee—Project Z-21) for final adoption at its next meeting. When approved by the latter group they will be submitted to the American Standards Association for adoption as American Standards.

A meeting of the Subcommittee on Gas Ranges to consider criticisms of the industry on the recommended revisions to the gas range requirements and the requirements for ranges designed to use propane and butane-air gas was held at the A. G. A. Laboratory on August 3 and 4. These requirements are now also ready for final adoption by the A. G. A. Approval Requirements Committee.

The proposed Approval Requirements for garage heaters have been passed by the A. G. A. Approval Requirements Committee with the exception of certain performance requirements for explosion hazard and a few minor revisions. Addi-

tional research has been conducted and it is felt that a satisfactory test method for determining explosion hazard has now been developed. The proposed requirements will be again reviewed by the Approval Requirements Committee (A. S. A. Sectional Committee, Project Z-21) at its meeting this month preparatory to submission to the industry in tentative form.

Approval Requirements for industrial gas boilers are in the course of preparation but will probably not be ready for release in tentative form for several months. Considerable research has been conducted by the Laboratory on various industrial boilers during recent months.

The recently organized Subcommittee on A. G. A. Approval Requirements for Gas-fired Refrigeration held its first meeting on August 17. A set of proposed specifications had been prepared by the chairman and submitted to the committee in advance of the meeting with the result that considerable progress was made at the initial session of this group.

Progress is being made in the development of A. G. A. Requirements for Accessories. The Laboratory has prepared a suggested set of requirements under the directions of the subcommittee that will be considered at the next meeting of the Accessory Committee in Detroit on or about September 16.

The 1931 revised A. G. A. requirements for Gas Water Heaters and for Central Heating Gas Appliances went into effect on September 1. On October 1, the A. G. A. Approval Requirements for Gas-Heated Ironers, and the 1931 revised A. G. A. Approval Requirements for Clothes Dryers will go into effect. On December 1, compliance with the revised approval requirements for space heaters becomes mandatory. On and after these dates tests for approval on the types of appliances affected will be made under the new standards.

Northern Indiana Plans Gas Equipment Show

ESTABLISHED Northern Indiana heating contractors, manufacturers of gas home heating equipment and the Northern Indiana Public Service Company are to hold an exhibit of gas heating equipment during September on the sales floors of the Northern Indiana Public Service Company in Hammond and South Bend. During the exhibit the Northern Indiana Public Service Company will clear its sales floors of everything else and turn over the entire space for the purpose of the exhibit.

The exhibit will be staged by those manufacturers whose home heating equipment has been approved for sale in accordance with the cooperative sales plan issued by the Northern Indiana Public Service Company April 1 this year. Seven furnace manufacturers, four boiler manufacturers, one gas-steam radiator manufacturer, and three conversion burner manufacturers will be represented.

The exhibit in Hammond will be from September 17-19 inclusive and invitations will be extended contractors from Hammond, East Chicago, Whiting, Indiana Harbor, Gary, Hobart, Michigan City, Valparaiso, Chesterton, Porter and Crown Point.

The South Bend exhibit will be held the following week, that is Tuesday and Wednesday September 22 and 23. Heating contractors will be invited to attend from South Bend, Mishawaka, Elkhart, Nappanee, Bremen, Goshen, Warsaw, Plymouth and Winamac.

In conjunction with the equipment exhibit, to which the public will be invited through adequate publicity, there will be a course on gas heating available for the attending heating contractors and architects. The course covering a day and a half, will be sponsored by Purdue University and prepared and presented by Professor R. B. Leckie, head of the Gas Engineering Department at Purdue and an outstanding authority on gas utilization.

H. W. Hartman's Father Dies

H. W. HARTMAN, assistant manager of The American Gas Association, was advised on August 31 of the death of his father, Ferries Hartman, who died suddenly on that date in San Francisco, Calif.

Commercial Section

E. R. ACKER, Chairman

J. W. WEST, Jr., Secretary

SAMUEL INSULL, Jr., Vice-Chairman

Surmounting Competition in the Domestic Field*

By HALL M. HENRY,

The Utility Management Corporation,
New York, N. Y.

THE subject of competition in the domestic field is indeed an appropriate one, in view of the many attempts now being launched to take from us that portion of our revenues derived from the domestic consumer and which has aptly been termed by some as the "backbone" of our business; by others, as the "bread and butter" load of the gas industry. Were the threatened loss of our "bread and butter" load the only result to expect from competition, the danger to our industry would be great. However, the loss of the domestic load represents a greater menace since it strikes at the very future of the industry itself. That this statement is true will be apparent if you will but study the rate structures of those electric companies who are making a determined drive for the domestic cooking and water heating load. It will also be apparent to you when you stop to consider that the electric industry is more vitally concerned with instantaneous demands than is the gas industry. Thus, if an electric company can obtain the cooking load for which service the consumer can afford to pay the highest rate, it is in a strategic position to make lower rates for water heating and other domestic uses, since through the proper wiring of electric switches the electric company can control the peak demands so that these additional uses of electricity come at off-peak hours, insofar as the individual consumer's load is concerned. Likewise, if we should lose the domestic cooking load, we will not be in as favorable a position to make inducement types of rates for the additional load in the home. I think we are safe then in saying the domestic cooking load holds the key to the future success of the electric industry in obtaining maximum development in the domestic field and it is, likewise, the key to the future growth of the gas industry.

What is this Competition?

Since the domestic load is of such vital importance to either the gas or electric industry, let us see what progress has been made by our competitor and analyze the factors most likely to contribute to his success. Let us see if there are any basic reasons why he should be able to annex our domestic load, or if his success has been due to a lack of proper appreciation

on our part of the conditions existing in our various properties, which makes it possible for our competitor to walk away with our domestic consumption. With a thorough understanding of all these factors and a realization of the problem before us we can then establish policies and plans best calculated to overcome the competition.

Progress Made by Our Competitor

That real progress has been made by our electric competitors is evidenced by the results obtained where they have aggressively gone after the business. In one natural gas property with approximately 40,000 gas customers, 800 electric ranges were sold in an eight weeks' campaign. In another group of natural gas properties having approximately 22,000 domestic consumers, 2,200 electric ranges were sold, or 10% of the domestic meters. In one of our own electric properties where the natural gas company is owned by other interests, the budget for electric ranges for the year 1931 is 8% of the electric meters. This, as you know, is equal to what is considered good practice on range selling in a well-managed gas property. In one of our gas properties 10% of our domestic consumers have electric ranges and it has been very difficult to make any headway with these electric range customers in selling gas for water heating, house heating, etc., due to our not having the cooking load to absorb the usual higher top rates. I might add that these electric range users are excellent prospects for electric water heaters and in my judgment the only reason they do not have them now is because the electric company is owned by the city and no promotional rates have been designed to attract this load and, of course, there is no aggressive merchandising activity. Aside from the fact that these electric ranges have practically shut the door to us for growth in this territory, these electric range users have made it doubly hard for us to sell our gas ranges and other gas appliances and have made it appear to our other consumers that there must be something to this idea that electricity is the coming fuel.

During the year 1930 there were some

200,000 electric ranges sold, bringing the total number in use to 1,000,000. It is apparent from these figures that the electric range has made considerable progress and that it offers a serious threat to our industry. That the gas range manufacturers generally are alive to the seriousness of the electric competition is disclosed in the following excerpts from letters received from some of them.

One writes:

"We are glad to note that some effort is to be made to interest the gas industry in the seriousness of the electric competition.

"We have felt for sometime that the attitude of the gas industry toward electric competition has been rather complacent, when events were transpiring that seemed to call for some concerted action on the part of the industry."

Another writes:

"Unfortunately I find the average utility does not seem to worry a lot about electric competition; yet the same utility that is not worrying is the one that is being affected."

And another writes after quoting some figures on electric ranges sold in territory where low priced natural gas is available:

"Certainly these figures should be startling to gas company executives and should awaken them to immediate action to combat this situation, and should certainly awaken those who are not yet seriously facing electric competition to immediate action to prevent it in its entirety. Prevention can actually be done, and combatting it to a standstill has also been successfully accomplished."

These statements indicate that range manufacturers appreciate the fact that the electric range has made sufficient progress to be classed as a real competitor and that we should be on our guard.

Factors Contributing to Success of Competitor

Since the electric range has reached the stage where it is a serious threat to our business and is making such rapid progress let us see what factors have made this possible. I believe we are justified, in view of the large number of electric ranges being sold in natural gas territories, in concluding from this fact that the question of operating cost has been largely eliminated. In other words, while it is true either natural or manufactured gas generally speaking, is cheaper as a fuel than electricity, yet this fact alone is no safeguard

* Paper presented before New England Regional Gas Sales Conference, New London, Conn., June 27, 1931.

against inroads being made into the use of gas for cooking. It follows then that the decision to use electricity rather than gas was made along other than economic lines. We are then forced to the conclusion that today the *measure of service to the consumer* is the main determining factor in the choice of a fuel and the selection of a range by a vast number of consumers.

Obsolete Appliances

Since service to the consumer is one of the prime motivating forces in the selection of a fuel or range and in view of the fact that the gas range will give the consumer all the advantages of an electric range and then some, it follows that a consumer changes to electricity because her present range fails to give her all the modern conveniences that she finds an electric range will give, or else she is not familiar with what a modern gas range will do.

There is little doubt but that an obsolete range constitutes one of the greatest contributing factors to sale of a modern electric range. When we realize the rapid strides which have been made in gas range design, making for comfort, convenience and accuracy in cooking, it is little wonder that any gas range user having a range over three years old is a live prospect for a modern range, whether gas or electric.

Lack of Proper Gas Range Advertising

The chances are about 9 to 1 that a large percentage of these prospects for a modern range have already made up their minds to buy an electric range. That our consumers are thinking electrically is evident from various surveys made to determine Mrs. Consumer's attitude toward gas. All such surveys that have come to my attention show that a very large percentage of our consumers have already decided that the next range they buy will be electric. We have no one but ourselves to blame for this state of affairs. We have been too busy advertising a range at a price instead of telling the public what gas will do, in a range equipped with modern devices. We have failed and failed miserably in the matter of advertising our gas service. Had we been on the alert to advertise and educate our consumers to the many helpful features resulting from the use of an automatic heat control, we would not now find our consumers giving an attentive ear to our competitor as he explains how in "an electric range you set the thermostat to the right temperature you want and forget your cooking." Thus the housewife, unconsciously forms a favorable opinion of electricity, *because it can be controlled*. Instead she would say, "Why, I can do that with my gas range." And, if we had stressed in our advertising how an insulated oven made the kitchen cooler, our competitor would have been stopped in his flowery discourse on how much cooler the electric range makes the kitchen by the remark, "Why, my oven is insulated." And, if we had been really on our job, Mrs. Consumer might

also add, "You know I have no way to heat my kitchen in the cool months and for that reason I prefer an uninsulated oven, since I can use my oven for warming the kitchen." We might well capitalize on the heat given off by an uninsulated range, since as a matter of fact there are more months out of the year requiring heat (about eight here in New England) than there are that do not require heat. Furthermore, more cooking is done in the cold months, requiring that a greater amount of time be spent in the kitchen preparing food. We might well point out that winter comfort is equally as important as summer comfort.

What is the Ideal Fuel for Cooking?

Now that we have set forth the fact that progress has been made by the electric industry and stated that two important reasons for this progress have been due to obsolete gas ranges and lack of proper advertising effort on the part of the gas companies, let us see if there are any inherent advantages to electricity that should give us cause to worry. In attacking this problem, we must first set forth the requirements for a fuel for cooking purposes:

1st. *The fuel must be capable of developing the highest temperature necessary for properly cooking the various foods.* It is conceded by all that gas and electricity can meet this requirement and that neither has an advantage insofar as meeting this requirement is concerned.

2d. *The fuel must be easily and readily controlled.* That gas can be as easily and readily controlled as electricity is evidenced by its use in industry on operations requiring temperatures to be controlled within two to five degrees and by the hundreds of thousands of heat controlled gas ranges in use. Neither fuel, then, has an advantage over the other in the matter of accuracy of temperature control.

3d. *The fuel must be economical in operating cost.* Gas, generally speaking, is the most economical of the various fuels and in the majority of cases where gas and electricity are available, gas is more economical to use than electricity. There is available comparative tests made by the American Gas Association and several of the leading universities from which can be determined the relative costs of cooking with gas and electricity with the rates available in a local situation. While I do not believe the operating cost is of serious moment to a large number of our consumers, yet it is satisfying to know that we can offer our consumer a fuel which is the most economical for his use.

4th. *The fuel should be flexible.* By this I mean that it should be able to meet the individual requirement of each cooking operation. If it takes 3,125 B.t.u.'s per hour to just keep a certain pot boiling, the fuel should be such that 3,125 B.t.u.'s per hour and no more will be going to this pot. Gas is one fuel that has this flexibility to the Nth degree; it is not a two or three heat fuel. While electricity can be made

through the proper use of resistances to give this flexibility, the cost of equipment to do this is such that thus far it is not possible with electric ranges. This is one reason why the electric companies have stressed oven cooking.

5th. *Another requirement of our ideal fuel is that it must have speed.* It should develop a cooking temperature in the shortest time possible. Gas is particularly the ideal fuel in this respect, since it develops its flame temperature instantly—no waiting—and has a decided advantage over electricity and other fuels in this regard.

6th. *The ideal fuel for cooking must be clean.* Gas and electricity are both clean fuels, yet I have heard both criticized because they were dirty. The truth of the matter was that the appliance in which the gas or electricity was used was dirty; yet these cleanest of fuels were being criticized because the appliance was at fault, or because someone else was negligent. How many times have you noticed the walls of a room over a steam or hot water radiator streaked with dirt. Yet we know the steam or the hot water are not dirty. The streaked condition was, of course, caused by circulation of air which in turn picked up dust particles from the floor and deposited them on the wall. In this same way, gas and electricity have been given credit for streaking kitchen walls, when this was occasioned by circulation of air which would happen regardless of the heating medium.

7th. *The ideal fuel should be dependable.* I am sure you will all agree there is no public utility service more dependable than gas. Gas has no superior in this respect.

8th. *The fuel used should be a safe fuel.* Most of you have undoubtedly seen the Underwriters' reports on accidents in which gas shows up as one of the safest of utility services. Gas certainly meets the requirement of safety equally as well as any fuel we have available today.

In the eight points which we have used to designate the ideal fuel for cooking, we find that gas ranks equally well with other fuels on four points and shows to a better advantage on the other four; these being—speed, flexibility, economy and dependability—and is without question the premier fuel for cooking.

What of the Electric Range?

Many of you are probably thinking that this is all right theoretically and some undoubtedly wondering if the electric range is satisfactory. To many users of the electric range it is apparently satisfactory; to others it is only partially so; while others are completely dissatisfied with electricity for cooking. An analysis made of 1,500 electric range users disclosed the fact that approximately 1,000 were satisfied; 200 partially dissatisfied; 50 dissatisfied and 250 had the ranges removed. We need not make an analysis of the gas range users to know that at least 1,500 former users of gas ranges were either dissatisfied with gas, or at least thought they were. In my

opinion these former gas users did not change because electricity as a *fuel is better than gas*, but solely because they were led to believe electricity was the means to automatic heat control—insulated ovens—time clocks, clean kitchens, etc., *rather than the equipment*. These consumers did not buy electricity but what the combination of the range and electricity would do. The housewife was sold on being relieved of watching an oven to see that her cake or pie or other baking did not burn, through the use of an *automatic heat control*; on being freed of an over-heated kitchen in summer through the *use of insulation*; on being able to place her food in the oven at an early hour of the day and have the oven automatically heated at a predetermined time through the *use of a clock control*. Thus she was sold on what a *heat control, insulation and a clock control* would do for her and she gave electricity credit for these wonders, because she had not heard of a gas range equipped with these labor saving and comfort giving devices.

It is evident from the foregoing that we have a competitor whose product is heir to the same ills of dissatisfaction as is our own when it is judged solely by the appliance in which it is used. Recognizing as we must that our competitor does not have a superior product and that his product has not yet gone through the "valuing by comparison" as has our product, and further recognizing that this "valuing by comparison" has been to the disadvantage of gas since the comparison was made with a modern electric range vs. an obsolete gas range and knowing as we now do that gas can and does give the housewife the ideal fuel if she will but buy the right appliance our problem before us is clearly one of education and aggressive merchandising to eliminate as many obsolete appliances as rapidly as possible.

Policy to Adopt Against Competition

The best way to meet any kind of competition is to anticipate it. If those of you who do not already have this competition will but realize that sooner or later competition must be met and immediately adopt a policy of prevention your task is easy. If you will make it a point to study the appeals used by the electric companies and start in to stress these appeals in your own advertising since you can offer these same features with your modern gas ranges, you will have taken a very valuable step in keeping out competition. In addition to well directed advertising your salesmen should be instructed on the various electric range features which have had the greatest appeal to the housewife so that they will recognize the need of stressing these particular features that are also available on the gas range and they should further be advised of the special features of speed, flexibility, economy and dependability which are obtainable *only* in a gas range. The salesmen should be instructed to tell this story of the gas range to every consumer he contacts

and where a range is in use which does not have the latest features every effort made to sell this consumer a modern gas range. Your greatest barrier to electric competition is a modern gas range in every home and the next best is that every consumer know just what a modern gas range can offer in the way of comfort, convenience, speed, flexibility and economy.

Advertising Policy

To those of you who now have this competition or expect it to develop shortly the best policy to adopt is to early meet this situation with aggressive advertising and sales methods. Our first move has been to increase our advertising appropriation and to change the advertising appeal. The advertising is designed to bring to the consumer's attention the facts that modern gas ranges will give them all the leisure, cool kitchens and convenience and accuracy in cooking that any other range will and in addition the gas range will be speedier, have greater flexibility and be more economical. In general, however, the exact nature of the advertising is gauged by that of the competition once we are face to face with the opposition. Every special feature that they attribute to the electric range is featured in one of our own ads and we add some other points for good measure. If any ambiguous or misleading statements are made these are called to the attention of the opposition management and if not corrected then the big siege guns of truth and fact are let loose at the competition. We have a product second to none, a growing industry, and we cannot permit misconceptions about our product to get started and we should be prepared to combat any false impressions with our own advertising.

Differentiate between Mechanical Features and Fuel Features

Our advertising should, in my opinion, be designed so that it not only emphasizes the value of heat controls, insulation, time clocks, self lighting burners, etc., but it should place particular emphasis on the features obtainable only on a gas range. We must in some way divorce the results brought about through the use of a particular piece of mechanical equipment which can be adopted and applied to most any fuel, from those due to the special characteristics of the fuel itself. We have had prepared a series of ads which illustrate the point I am trying to convey to you. For instance, one ad reads: "It's the Thermostat (with picture of a thermostat) that gives you Heat Control but it's *Gas* that gives you Flexibility." In another—"It's the time clock that gives you Leisure"—"but it's *Gas* that gives you economical cooking"—It's the *Insulation* that keeps the kitchen cool, but it's *gas* that gives you the Speed. The thought back of this advertising is, as I pointed out previously, to differentiate those things which are due to the mechanical device from those due to the fuel itself. We may be wrong in our belief that the consumer is giving

electricity, the fuel, credit for automatic heat control or time clocks which give leisure hours, yet we feel in any event there is no harm in placing the credit where it belongs and not have some particular fuel create the impression it is the one responsible for these fine results. If we can get our consumers to place the credit where credit is due then I am sure we will have made a big step forward in overcoming all competition.

We have had numerous attempts made by our competitors to establish their product in our territories, through long terms, low down payments, large allowances on old range, free installations, claims of low operating costs, etc. I am glad to be able to tell you that most of these competitors have abandoned their efforts, due to the fact that they were unable to place a sufficient volume of business to warrant the expenditures involved. On our part we of course had to spend a large sum to hold business we were already enjoying. We are satisfied, however, that if we had not taken an aggressive position our competitors would have annexed a sizable load which we are frank to admit in itself would not have been serious nor justified our own efforts and expenditures necessary to retain this load, however, in terms of the effect on future business was well worth every penny spent. The reason for this is that any modern range regardless of the fuel used is superior to the gas range in use by most of our consumers, so that the more consumers that buy a modern range heated by fuels other than gas, the greater the number of boosters for the fuel used in the range purchased. This is because the consumer usually attributes the many new features to the type of fuel used rather than to the many new mechanical devices. Due to this fact we believe it imperative that we make every effort to keep our competitor from selling *any* ranges for then there are no boosters for his product. I personally feel that we should gauge our expenditures with the thought in mind of keeping out entirely the competitor's product rather than on the basis that he will not sell many ranges anyway. I can assure you this later policy is a very dangerous one as evidenced by the fact that in one of our own gas properties there are 10% of the consumers using a competitive fuel and since we have acquired this property we have had to spend many times the amount of money in overcoming the strong tendency to adopt a competitive fuel as would have been required to smash the opposition at the start of his activity.

Sell Different Method of Cooking

Advertising designed to inform our consumers as to the mechanical features which are available on the modern gas range are not in themselves sufficient weapons against the electric competition. As soon as our competitor finds he has practically exhausted the buying appeals of certain mechanical features he finds other features calculated to stimulate buying. Thus we

find the new electric appeal one of a different method of cooking and this is smart merchandising. It shows that the electric man understands the woman buying psychology, "which is change." She will buy anything if it is different (provided she has the price). We have found that a good way to meet this kind of competition is for us to also sell a different method of cooking—sell a cooking appliance which is not just another gas range. Sell one that cooks differently from the ordinary range—one that has zone cooking or some other cooking principle, just so it is not one the housewife has been accustomed to.

We have been able in many instances where a customer had definitely decided to buy an electric range and would not listen to any of our sales talks on the conventional type of range, including the modern console types, etc., to arouse and hold the interest of our consumer to a new principle or method of cooking and due to the new principle or method sell her a gas range, and do this after all other methods had failed. Our experience has conclusively demonstrated the value of a smooth top or closed top range in meeting competition—and this type of range is acknowledged by our New Business men as having features which best meet competition.

I have made it a point to talk with New Business men from other companies on what type of range best meets electric competition and most of them agree on the closed top. The consensus of opinion being that its success is due to the fact that it offers a new principle of cooking and second there is no chance for the competitor to capitalize on lack of cleanliness or fumes, etc. Our own experience, however, with the smooth top or closed top range has taught us that this type of range calls for specialist selling if it is to be sold in quantities. This is a good feature in a way for it takes specialized selling to sell electric ranges and if we have specialists selling our gas ranges we should be in a better position to meet their selling arguments. I can recommend to you this plan of selling a different method of cooking as an effective weapon against competition.

Loan of Competitive Range

Another practice we have found helpful is to loan a prospective purchaser of an electric range one for her use. We generally have several recent models we have taken in on trade and we offer to loan this to the prospective electric range user. This has never failed to produce a confirmed user of gas for cooking. You should, however, be certain that you loan one of the latest model competitive ranges.

One other practice which has proven effective is to offer at a low price (say \$25.) one of the recent model electric ranges (usually one we have taken in on trade) to a prospective electric range user. We also suggest to the prospective competitive fuel user that she call up the former owner to verify our statements that

that range is in good condition. The low value placed on the range coupled with the fact that someone has given up electric cooking is usually sufficient to convince the customer she really does not want to change from gas fuel. However, if this fails and she does call up the former owner this former electric range user usually convinces the customer that what she wants is not a change of fuel but a new gas range.

I have attempted to point out to you in the above the importance of recognizing that you can expect competition if you do not already have it; of the need for immediate action to forestall competition through properly directed advertising and sales efforts; of the value of a different method of cooking and the need for specialists in selling this new method of cooking; of the effect of either loaning or offering an electric range at a low price; of the value of a closed top range and of the need to replace as quickly as possible all obsolete ranges with modern gas ranges, all of which we have found of definite and tangible value to our companies in surmounting electric competition. We must not overlook the value of home service in this work and I am sure you all appreciate and recognize the real assistance which comes from the Home Service Departments of your companies.

Cooperation with Manufacturers

I want to here emphasize the need for closer cooperation between the manufacturer of gas appliances and the gas companies. We can no longer continue our separate ways but must join forces to better overcome the competition. It is only through close contact that we can properly keep the manufacturer informed as to the real needs of the industry so that he can properly interpret these needs in terms of the correct equipment. We must jointly study our consumer needs and early determine the trend in competitive equipment so that we can not only meet the competition with equal features but with advanced features. We must lead and not follow if we are to hold the confidence and support of our consumers. We should continually test our consumer attitude so that we do not lose touch with the everchanging requirements of Mr. and Mrs. Consumer. We must ever strive to improve the appearance and the resulting service from our gas appliances. We cannot longer be content with last year's models and designs. We must realize we are not selling gas but what gas in a particular appliance will do. I can think of no single item which would do more to overcome competition than a realization on the part of the gas industry that the manufacturer is as vital to the future success of the industry as is the gas industry itself. If over night we could get the industry to accept this principle we would certainly see more real progress and the question of competition would eventually disappear.

Manufacturers Are Organizing to Better Serve the Industry

I have pointed out previously the manufacturers are alive to the seriousness of the electric competition. They are even organizing to better cope with this situation. This organization if successful will make possible the cross licensing of patents similar to that existing in the automobile field. This will make it possible for all manufacturers to incorporate in their product the many new features developed by each manufacturer, whereas in the past we find many of these new features limited to the product produced by the company that just developed the new feature. As long as the range manufacturers were competing primarily with each other there was no incentive to the free exchange of ideas and special patented features. However, now that the problem confronting the manufacturers is not whether it shall be his particular gas range, but whether it shall be a gas range at all, the need for closer cooperation between the manufacturers is readily apparent. If the manufacturers are successful in reaching a working agreement we should find in this an important aid to surmounting our competition for our gas ranges will be greatly improved and we will be able to offer a gas range embodying all the best features now available only on different ranges. We should lend every encouragement and support to this move on the part of the range manufacturers and do all we can to speed the final working out of all details in relation to the proposed organization. I can see the time approaching (and would it were here now) when these cooperating manufacturers will through their organization and the gas industry make a consumer analysis to find out just what constitutes the best cooking features for a gas range and they will jointly finance the construction of such a range, and thus make available a gas range which will defy any kind of competition since the range is built to meet Mrs. Consumer's requirements. One of our serious problems has been to get the manufacturers to build the so-called ideal range. This has not been due to the fact that the manufacturer did not want to build the ideal range but because he could not afford to do so.

I am also confident that through this organization we will be able to overcome some of the erroneous ideas now apparent among some of the manufacturers. I have been very much surprised to learn that many of our gas appliance manufacturers have the idea that we do not want higher efficiencies from gas appliances. It seems to me that we must correct this impression for unless we do, we are going to lose one of our strong talking points, namely, low operating cost. I would like to urge each of you to review, if you will, the progress made by our competitors and I am certain you will find that this progress has been due in a large measure, aside from the general improvement in control, ease of operation, etc., to the very high efficiency of the competitive equipment. I would like

to especially call your attention to the steps now being taken here in New England by our competitors to lower the cost of heating water. I am convinced we have too long ignored not only the efficiency of the appliance but also the overall efficiency of the equipment after it has been installed. We must in the future give more attention to operating efficiencies and, in turn, operating costs.

All of these erroneous ideas of the manufacturers are a serious indictment of us as an industry and if we are to surmount our competition we must early correct these wrong impressions so that we will be presenting a united front to the enemy.

National Advertising

I have attempted to check into the amount of national advertising being spent yearly by the manufacturers of gas and electric ranges. I find that for the year 1929, the gas range companies spent \$245,457 for national advertising, whereas the electric range companies spent \$99,300. In 1930 the gas range people increased their range advertising to \$391,697 and the electric to \$156,627. For the year 1931 the budget figures for the gas range companies are rather incomplete. However, it does not appear as though the 1930 figure will be exceeded and will possibly be less. The electric budgeted advertising, however, indicates that close to \$250,000 will be spent in 1931 advertising the electric range. It is apparent from these figures that the electric range companies are out to sell the electric range idea. You have also probably noticed the amount of space devoted to the electric range in the various home economics departments of the national magazines. The amount of space thus devoted to a particular type of appliance is determined largely by the amount of advertising placed with the magazines. Up to the present time the gas range companies have spent more money with national magazines than the electric companies, but I am confident they have not received their share of publicity. This should be watched so that gas has an equal chance to display its virtues.

There is one tendency on the part of the range manufacturers which I think should be called to your attention and that is the tendency to discontinue national advertising and place advertising locally with the companies purchasing their product. This change in policy has undoubtedly been brought about by the gas companies themselves. An appliance company which has never carried on national advertising will offer to spend so much money locally if the gas company will buy its product and, of course, if the company that has always spent its money nationally finds its efforts in this direction are not appreciated, it will naturally discontinue national advertising and spend its advertising appropriation locally.

Another contributing factor is the tendency to beat the manufacturer down on his price. This practice has forced many a company to curtail its national advertising and may, if the practice is not discon-

tinued, result in the gas range companies manufacturing electric ranges. If we are to successfully surmount electric competition, we are going to need the help of all the agencies at our command and we cannot afford to let some practice on our part jeopardize these allies and so cripple them that they can be of no value to us. The electric range manufacturers are backed by strong financial interests and are in a position to carry on the pioneering work of selling electric ranges and we should do everything we can to strengthen our own gas appliance manufacturers so that we will have equally as strong allies.

Some of these points may appear to many of you to be outside the realm of a paper of this kind, but I feel that all phases of this subject and all items having a bearing on the final success of the gas industry in surmounting competition should be frankly and honestly discussed. All of us have undoubtedly been guilty of contributing to the success of the electric competition, through certain acts of our own and it is only by our recognizing the effect of our various actions that we can seek and find a solution to electric competition.

There was a time in our history when the sale of gas ranges could be classed as a strictly merchandising activity and most of us were uninterested in the sale of ranges, excepting from the standpoint of a merchandising profit. Today, however, we must look on the sale of gas ranges in a different light. We are no longer in a position to ignore the gas range and class it as a merchandising item alone. While the sale of a gas range itself cannot be placed in that preferred class of appliance selling, "the sale of load building appliances," it is of even greater importance since it must act in a dual capacity. It must first retain the load we already have, and second, this very act of holding the cooking load paves the way to future load building possibilities in the domestic field. In view of this dual purpose of the gas range, I believe you must agree it can no longer be classed as a merchandising proposition alone. We should, therefore, change our present policies where they have been made without due regard to the important role the gas range must play in the future of our industry and these policies should be such that no obstructions are placed in the way of selling gas ranges of the most modern and approved type; or, of keeping constantly before the public the idea that the "gas way is the best way."

I have attempted to point out the seriousness of electric competition and to give you some idea as to how a few of the properties have been able to successfully cope with it. There is no doubt in my mind regarding the outcome of any battle between the electric company and the gas company for the domestic load, provided the gas company early recognizes the seriousness of the attack on his domestic load and immediately sets out to overwhelm the opposition. To my way of thinking, we would not now be confronted with electric

competition if certain of our companies had realized there was a real menace in the attempt of the electric company to take our cooking load, and had taken steps to keep the electric company from selling any ranges. Unfortunately, however, certain of the electric companies have been successful in selling electric ranges and this has spurred other companies to greater activity. Thus we find, due to the success of these other electric companies we have to spend thousands of dollars combatting the electric range idea when we, as well as the consumers, might better be spending our money on other gas appliances. It appears to me that we are our "brother's keeper" and it is up to each of us to put down the electric threat as quickly and decisively as possible. The sooner we make the electric industry realize they cannot just walk in and take away our domestic load and the sooner we discourage them in any further attempts, by placing as many obstacles as we can in their path, the sooner we will be left in peace to continue our great load building program. We must then meet this threat with a united front and each of us recognize the responsibilities we have to each other. If we will but do this, I am sure we will find the gas way continuing to be the best way for our consumers.

To Entertain A. G. A. Members



Joseph Rodgers, who heads the South Sea Islanders, one of the features of the entertainment program at the Atlantic City Convention.

Technical Section

R. G. GRISWOLD, Chairman

H. W. HARTMAN, Secretary

K. H. CREE, Asst. Secretary

I. K. PECK, Vice-Chairman

Use of Bunker Oils on Atlantic Seaboard*

DURING the past few years the technical progress in the use of the water gas machine has been so rapid that it has been difficult to keep pace with it. The subject of this paper suggests what is probably the most important recent development as it is progressing in plants on the Atlantic seaboard.

The use of bunker or fuels oils in the water gas machine was thought of origi-

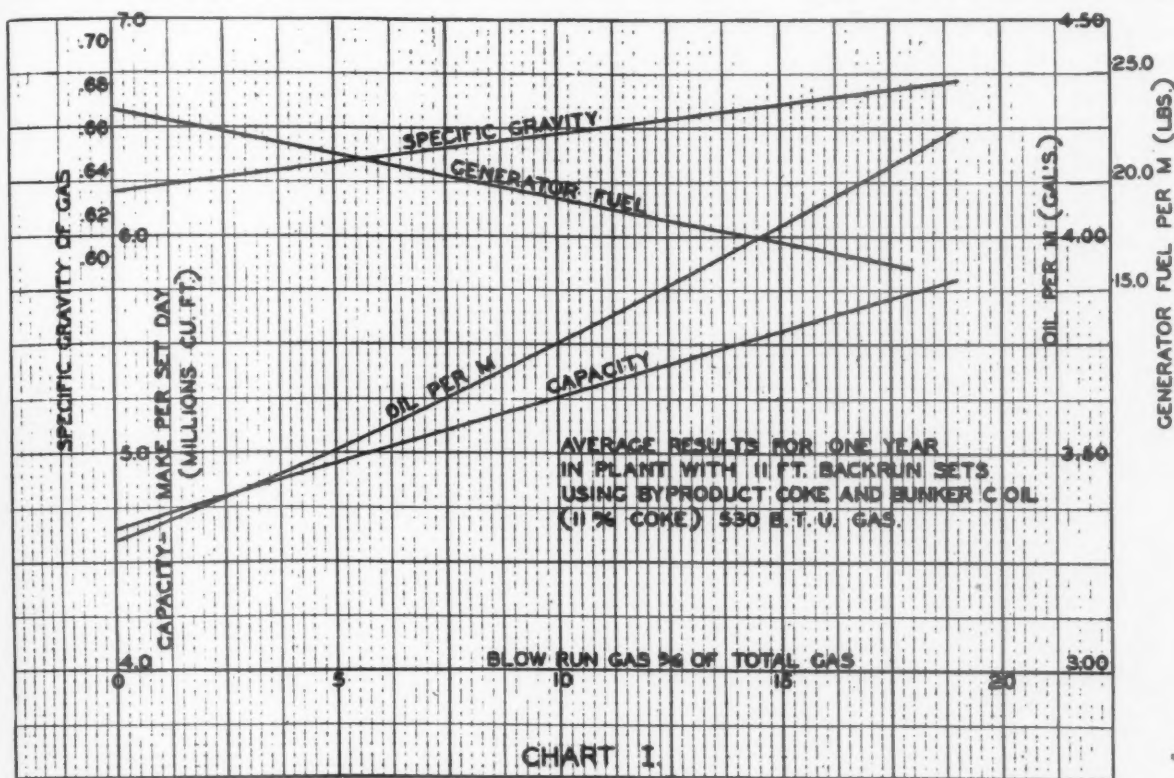
By W. J. HARVEY,

Public Service Electric & Gas Co.,
Paterson, N. J.

The term "bunker oil," classified by our government into three groups principally for their viscosity or handling characteristics, is used in this discussion as including all the petroleum fractions, heavy distillates and cracking still residues which have no

F. set for Bunker C oils. It is possible to purchase large quantities of this type oil with less than 12 per cent coke residue, two and one-half per cent sulphur and viscosity 300 seconds or less, and such oils can be used for water gas carburetting with excellent results in a plant properly equipped for handling them.

Analysis of oils before using them is helpful and gives an approximation of their



nally as a retreat before the constantly advancing price of gas oils. It was regarded, by those who foresaw its use, as necessary evil, the only redeeming feature of which was the possibility that production costs might be held down to approximately existing figures. Now, however, after more than a year of its use in plants ranging in size from small to large, bunker oil stands out not only as a distinct advance in the technique of water gas, but promises to be an important stabilizer of production cost.

* Paper presented before American Gas Association Joint Production and Chemical Conference, Philadelphia, Pa., May 21, 1931.

value in general commercial use except as fuels, and which are fluid enough to be used for common fuel oil in industrial or marine use. It is obvious that with such mixtures ordinary bunker oil classification for viscosity, flashpoint, etc. can give no information as to the value of an oil as a carburetting agent. It has been found, however, that a large part of the bunker oil offered for sale in the vicinity of New York harbor is of a type which can be used for carburetting. Such oils usually contain less than 15 per cent coke residue, 3 per cent sulphur, and have viscosities within the limit of 300 seconds Saybolt Furol at 122°

suitability. A test showing viscosity, carbon and sulphur content, and a laboratory cracking test giving approximate carburetting values are guides to the operator as to what he may expect in operating results. The laboratory cracking test, although in its present development not capable of predicting exactly the cracking values obtained in practice, has been found very helpful in approximating these results, and in predicting the relative values of two or more oils, one of which has been tried out in the water gas machine.

Bunker oil has been in use on full plant scale for more than a year in several plants

on the Eastern seaboard, one plant alone having used a million barrels during the past year. This operation is the outcome of more than ten years of experimentation, principally by the United Gas Improvement Company, in an effort to use oils other than gas oils for carburetting. The results of this work has been the development of several methods of introducing high coke oils into a standard type water gas machine with but a few minor changes. The details of this development and a discussion of the methods and necessary equipment already have been thoroughly brought out in papers by Mr. Dashiell† and Mr. Richards.§

The method of operation with Bunker oil principally in use during the past year by companies on the Atlantic seaboard is the checkerless carburetter with atomizing spray, with some of the oil vaporized directly on the fuel bed. This method enables the operator to use oil in the carburetter or on the generator fire or both in whatever proportions give him the best results. It makes possible great flexibility of operation in the use of generator fuel and oil, in practice permitting the operator to use more of the material which is the cheaper.

With this arrangement of apparatus there are four principal situations which may arise to which the operation in each case must be adjusted for maximum economy:

1. Oil is high priced, generator fuel low priced, oil is of good quality. This demands low oil consumption and is comparable with the usual operation with gas oils, except that the high coke content of the oil requires a checkerless carburetter. This might be the case in a plant using Bunker B oil and bituminous coal mixtures for generator fuel, and where the oil is comparatively expensive because of its quality and perhaps high freight cost.

2. Oil is high priced, generator fuel low priced, oil of quality inferior to that of preceding case. Due to its poorer quality, the amount necessary for carburetting is greater and some of it must be vaporized on the generator fire, the vaporizing capacity of the carburetter having been exceeded. In this case the coke residue and some of the heavier distillates are retained in the fuel bed and are used for generator fuel, thus reducing the consumption of solid fuel. This situation is typical of a plant using cheap solid fuels and Bunker C oils and where the oil freight cost is high.

3. Let us now consider the case of low oil cost and comparatively high cost solid fuel. This is typical of most plants on the Eastern seaboard, particularly those directly on tidewater. It is obvious that here the set-up calls for conservation of solid fuels at the expense of oil. In the past year, operating methods have been developed by which the amount of coke per M can be

† "The Use of Heavy Fuel Oil in the Manufacture of Carburetted Water Gas." 1930 A. G. A. Convention, P. T. Dashiell.

‡ "The Use of Heavy Oils for Carburetting." "Gas Age-Record" 2.14.31, P. T. Dashiell.

§ "Recent Developments in Carburetting Water Gas with Bunker Oils." 1930 Production Conference, Cleveland, J. V. Richards.

TABLE I
Comparison of Results with Gas Oil as Against Bunker C Oil in the Same Plant
(Compiled from Works Operating Data)

	Gas Oil	Bunker C Oil (Analysis No. 2, Table 2)
Beaumé of oil.....	24.0	15.3
Coke used.....	By-Product	By-Product
Generator fuel lb./M.....	26.2	15.8
Oil gals./M.....	2.90	4.18
Steam to sets lbs./M.....	38.0	30.3
B.t.u. of gas.....	535	535
Gravity of gas.....	.62	.68
H ₂ S crude gas gr./100 cu.ft.....	120	260
Residuals: Gals.		
Tar/M.....	.72	.92
Tar, gal. oil.....	.25	.23
Drip oil/M.....	.06	.08
Drip oil/gal. oil.....	.02	.019
Make per set day, M cu.ft.....	4,500	5,700

APPROXIMATE HEAT BALANCE
(Not Including Waste Heat Boiler)

	Energy Input Gas Oil	Bunker C Oil (Analysis No. 2, Table 2)
Generator fuel.....	41.8%	23.3%
Oil.....	52.3%	72.8%
Steam.....	5.9%	3.9%
	100.0%	100.0%
	Energy Output—Useful Materials	
Finished gas.....	65.8%	61.1%
Tar.....	13.5%	15.3%
Light oils.....	1.0%	1.4%
	80.3%	77.8%

reduced by increasing the oil while retaining control of the B.t.u.'s and gravity of gas.

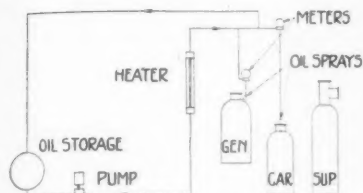
4. The fourth case is a special one and concerns residuals. It has been found in

some plants that the quality of the tar produced by a given bunker oil can be controlled to a large degree by adjusting operating methods. The method which produces the best grade of tar may or may not

TABLE II
Bunker Oils Used and Resulting Tars

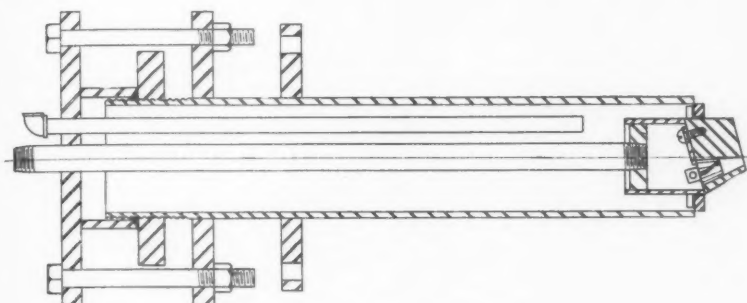
	(1)	(2)	(3)	(4)	(5)
Oil—Beaumé.....	14.9	15.3	17.0	16.6	Same oil
Carbon residue %.....	7.1	11.1	6.2	8.9	as (2)
Viscosity S.F. @ 122° F. (sec.).....	271	135	145	53	Gen. fuel
Sulphur % by weight.....	0.60	2.08	0.65	1.93	80% soft
Distillation (% vol.).....					20% coke
450 to 600.....	59.0	12.0	1.7	13.5	
600 to 700.....	25.0	13.0	25.2	31.1	
over 700.....	9.0	59.8	66.2	43.6	
Laboratory cracking test max. yield B.t.u./gal.	96,500	98,000	100,000	97,100	98,000
Superheater temp. ° F.....	1,380	1,530	1,480	1,430	1,450
Generator fuel.....	Coke	Coke	Coke	Coke	
Generator fuel/M lbs.....	22.0	15.8	14.7		25.0
Oil/M gals.....	3.55	4.18	4.12		3.40
B.t.u. finished gas.....	532	535	535	530	530
Tar Produced (Dehydrated with oil returned)					
Sp.gr. at 25° C.....	1.087	1.170		1.123	1.134
Viscosity 50 cc. at 60° C. Engler.....	110	530	135	90	325
% free carbon.....	4.4	12.5	7.4	3.5	10.2
Distillation to 300° C. %.....	29.8		25.9	28.6	31.8
Distillation to coke.....	70.5				
Tar yield % of oil used.....	25.0	23.2			
Minimum handling temp.....	90° F.	140° F.	100° F.	85° F.	125° F.

coincide with that which produces the best operating results exclusive of tar quality. Therefore this becomes a special case of modified operating for tar quality.



Diagrammatic elevation of oil piping

In Chart 1 are given the approximate relations between set capacity, oil and generator fuel consumption and specific gravity of gas, plotted from operating data in



Section through generator oil spray

a plant using Bunker C oil over a period of a year. The flexibility of operation is evident, with a range in fuel consumption from 22.8 lbs. with 3.30 gals. of oil per M to 15.8 lbs. with 4.18 gals. of oil. Throughout this range, with resulting capacities from $4\frac{1}{2}$ to $5\frac{3}{4}$ million cu.ft. per set day, the increase in specific gravity of the gas has been limited to .05, from .63 to .68. In general, the capacity obtained when using Bunker oil has been found to compare favorably with that obtained previously in the same plants when using gas oils. This applies to plants using either coke or soft coal mixtures for generator fuel. Plants using soft coal coke mixtures for generator fuel and Bunker oil, some for more than a year, have maintained their previous gas oil capacities and have shown excellent economies.

Following are representative average results for plants operating in this manner with Bunker C oils, compared with former results on gas oil:

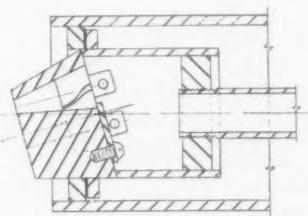
	Bunker C Oil	Gas Oil
Generator fuel per		
M*	24-25 lbs.	28-29 lbs.
Oil per M	3.40 gals.	2.85 gals.

* Approximately 80 per cent coal, 20 per cent coke.

Thus in changing from gas oil to fuel oil, the oil consumption has increased about one-half gallon per M and the consumption of solid fuel has been lowered by approximately four pounds.

A heat balance comparison between bunker oil operation and gas oil operation in the same plant shows that the proportion of input energy transferred into useful materials is slightly less with bunker oil. The accompanying table is computed from the results with both oils, using the checkerless carburettor with bunker oil. By comparing this data it is apparent that the gas made with bunker oil in this plant is produced principally from oil, 72 per cent of the energy coming from that material, whereas in the previous gas oil operation only 52 per cent of the energy came from the oil. The operating results upon which this heat balance is based are given in the accompanying table.

The subject of residuals produced from bunker oil is one of particular interest to the gas manufacturer. In general it may be said that as a proportion by volume of the oil used the volumes of light oils and

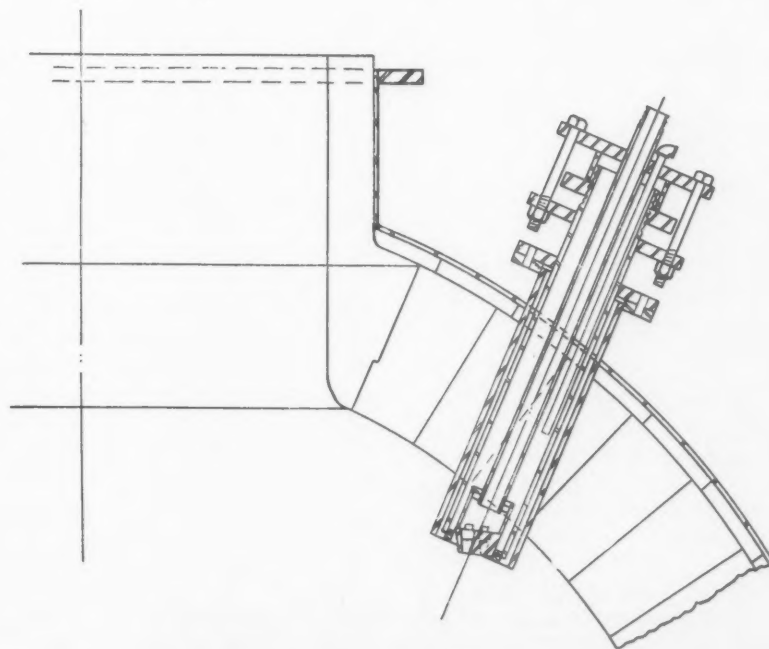


Section through oil spray head

tar recovered are approximately the same for bunker oil as for gas oil; that the characteristics of the tars are radically different, and that the higher the carbon content of the oil the higher will be the carbon content and viscosity of the tar for a given method of operation. Since, however, the method of operation has a distinct bearing on tar characteristics, there are occasionally apparent contradictions in this respect.

In Table 2 are given the characteristics of several bunker oil tars and those of the oils from which they were produced. It is evident from the viscosities given that tar handling constitutes a problem in itself, necessitating heating and storage equipment not required for ordinary gas oil tars.

The problem of disposal of this tar for other than its fuel value, for instance in



Section through generator showing oil spray

road making, is one in which progress is being made steadily. Of necessity the introduction of a manufacturing material in a different form than usual is accompanied by resistance to the necessary revision of the method by which it must be used. For example, in spite of the fact that coke, due to its good qualities, is rapidly establishing itself as a recognized fuel for house heating, the conversion at first was slow and somewhat discouraging, due to inertia of custom. It is not probable that many of the highways of the East will be paved with bunker oil tars this year or next. However, some of them will and, due to the excellent character of these tars for road materials, there seems to be a probability that the number will increase.

The particular application of bunker oils to those plants adjacent to the Atlantic seaboard lies almost entirely in the prospect of a continuous supply of these oils at a price substantially below that of even medium grades of gas oil. The position of bunker oil in the price scale for petroleum products must of necessity be determined by the fact that it is primarily a fuel oil competing with solid fuels on a B.t.u. basis. While such oils, like any other commodity, will fluctuate in price, their price range is likely to be narrower than that of better quality oils.

It is estimated that the volume of fuel oil handled annually in the vicinity of New York harbor is approximately 100,000,000 barrels. In this area, then, the influence of large volumes of these oils in assuring a reliable source of supply is obvious and illustrates best, perhaps, the advantageous position occupied by plants here located.

Here Are Some Facts About "Small" Gas Bills

(Continued from page 400)

Users and Non-Users

Another often unrealized fact about the actual "small bill" customers is that they are largely of two general classes: folks who go out for most of their meals except breakfast, and the "convenience" users who want a little gas for dental work, cigar lighting and so on. Families of economical habit are seldom among the "small bill" customers. They appreciate and utilize gas-service. Instead of eating out, or buying ready cooked foods, they find it more economical to do their cooking at home.

The results of an investigation of this were published once in the Year Book. A group of apartments at substantial rentals showed an average

monthly gas consumption of only 658 cubic feet per customer, while a row of less pretentious homes showed an average monthly consumption of 3,472 cubic feet per customer.

These facts destroy the argument that the minimum monthly bill is a "hardship" on customers who have to spend carefully. On the contrary, they are the customers who recognize generally that gas-service is the cheapest thing they buy.

Widening the Network of Gas Mains

(Continued from page 399)

other words, 71.3 more miles of gas mains in four wards than miles of sewers in five wards.

It is worthy of mention that the demand for public improvements of a non-assessable character are exceeded only by the objections to those assessable on the property benefited.

During the year 1930 there was added to our distribution system, nineteen miles of gas mains. Additions to our system this year have been much less, due to an almost complete suspension of new building operations.

Industrial Gas Research in Scaling of Steel

(Continued from page 407)

ods of time confirm the results obtained at two hours.

The results of the tests made with increasing time show, as would normally be expected, that the amount of scaling increases with the length of time that the steel is exposed to the scaling medium. The rate of scaling, however, decreases with increasing time and with atmospheres of oxygen and dry air, and at a temperature of 1520° F. the curve showing the change in rate is of the parabolic type. At the same temperature and an atmosphere of carbon dioxide the curve showing the increase in the amount of scale appears to be a straight line.

Natural Gas Proceedings

for the years 1922, 1924,
1925, 1926, 1927, 1928
and 1929 are available to
members at \$1.00 per vol-
ume postpaid.

Inasmuch as the supply of
these volumes is limited,
requests for copies will be
filled in the order of their
receipt.

ADDRESS

AMERICAN GAS ASSOCIATION

420 Lexington Avenue
New York City

Industrial Gas Section

D. W. CHAPMAN, Chairman

C. W. BERGHORN, Secretary

A. J. PETERS, Vice-Chairman

Data on Industrial Gas Installations

EACH year the Industrial Gas Section has collected through its Progress Committee detailed data on successful sale of gas for industrial purposes. These sheets are printed up and constitute one of the most valuable tools for every industrial engineer. Not only are they sources of information on what is being done elsewhere, but they include comments from the user, which can be used as the basis for sales arguments for other similar installations.

Every progressive industrial gas salesman who has been taking the A. G. A. Industrial Salesman's Course will remember how many times in the course it was urged to prepare adequately for sales interviews. Such preparation certainly includes reference to these data sheets.

Another use of the sheets which has been successful is in the salesman's presentation book. In other words, the insertion of these loose-leaf sheets appropriate to a given prospect enable the salesman to have something in his hand to show and point to. The print is large, and the sheets are attractively gotten up on calendared paper. The prospect could easily read from across the corner of a desk. It is not recommended that a salesman should give these to a prospect, but utilize them in the effective ways that are suggested in the Sales Course.

There are a few sets of sheets from the

past year still available. In order to bring them within reach of every industrial salesman a special price is offered. Sheets normally sell for \$1 a set, but as a special inducement to bring these to the widest possible attention they are offered now for 50 cents a set. Sheets are available as follows:—

1926 Series Plants No. 93 to 149 inclusive.

1927 Series Plants No. 150 to 176 inclusive.

1928 Series Plants No. 177 to 245 inclusive.

1929 Series Plants No. 246 to 298 inclusive.

1930 Series Plants No. 299 to 345 inclusive.

These data sheets cover practically every industrial use for gas. Among important sheets within the last two years are the following:

Heat Treating, Ferrous and Non-Ferrous Metals, Melting of Stereotype, Die-Casting, Aluminum, Zinc, Brass, Bronze, and other soft metals, Wholesale Baking, Core Baking and Japanning.

There are a number of sheets on various applications of gas in the ceramic industry including:

Terra Cotta, Brick, Sewer Tile, Refractories, Vitreous Enameling and Frit Melting.

Large Volume Water Heating

REQUESTS are received frequently at A. G. A. Headquarters of progress being made in the large volume water heating field. Nevertheless many gas companies have not yet given this important new business possibility as much attention as it really deserves. The potential business which can be secured in this attractive unsold market is discussed at some length in the A. G. A. book *Water Heating*.

Copies of this book should certainly be in the hands of every industrial gas salesman not only because it contains information on large volume water heating, but also because it is full of data which is of use in other fields. It includes a great deal of helpful material on piping, cold water supply, efficiency of steam and hot water boilers, a full chapter is devoted to the subject of domestic water heating and in the appendix there is useful data on the load building characteristics of all classes of water heaters from

the small domestic to the largest industrial large volume installations.

The book is attractively gotten up in silver covers. It is 135 pages, 8½ x 11 size, profusely illustrated. The price of the book, \$1.50 per copy is so low that several of the larger utility companies have found it advisable to present this book to leading architects and prominent plumbing houses. It has enormous value as a good-will builder apart from the useful information that it contains.

There is no excuse for delaying before securing this publication and your order can be promptly filled from an ample supply on hand at A. G. A. Headquarters.

Progress on A. G. A. Exhibition at Steel Treaters Show

CONFERENCE between W. H. Eisenman, secretary, American Society for Steel Treating; L. B. Crossman, chairman, Display and Contact Committee; and C. W. Berghorn held at Boston, August 5, resulted in satisfactory arrangements for

the forthcoming Steel Treaters Exhibition, which will be held in Boston, September 21 to 25.

The American Gas Association as usual will occupy a large proportion of the total space and all gas exhibitors will be grouped in this section. This year 6,700 sq.ft. of space will be filled with gas exhibits. Some of the leading manufacturers who are taking part include—

Ensign-Reynolds Company.
The C. M. Kemp Mfg. Co.
Charles A. Hones, Inc.
Surface Combustion Corporation.
American Gas Furnace Co.
The Selsas Company.
Gehrich Oven Co., Inc.
The Paul Maehler Company.
The Electrogas Furnace Co.
The Gas Machinery Co.

New Gas Rate Schedules Effective in Brooklyn

(Continued from page 389)

While The Brooklyn Union Gas Company has a large number of customers who use in excess of 100,000 cu.ft. per month, the vast majority paid at the rate of \$1.15 per thousand under the old rates. Under the new schedule, those who use more than 2,200 cu.ft. per month will pay at slightly lower rates, and savings increase as the consumption mounts.

In its application to the Public Service Commission the company pointed out that under the old rates consumers who used gas in very small quantities did not pay enough to cover the cost of serving them, and that this loss had to be borne by the larger consumers. The company asked permission to make a minimum monthly charge which would equalize the burden and allow a lowering of the rate to those who used a sizable quantity of gas each month.

The Brooklyn company is hopeful that the new rates will encourage the use of gas among both domestic and industrial customers. Inasmuch as the new schedule affords substantial savings to larger consumers, especially those whose heaviest demand comes during the spring, summer and fall months, it is believed that many manufacturers can be shown the benefits of using gas in their industrial processes.

Industrial Gas Bibliography

FOLLOWING is a supplementary list to the Selected Bibliography of Industrial Gas Articles:

- Asphalt and Bitumen Melting—A-1*
- Industrial & Engineering Chemistry .. Heating asphalt by diphenyl vapor..... July 1931, p. 763-9
(Rate of heat transfer in a forced circulation apparatus.)
- Cutting—A-XI*
- Engineering News Record New series of tests on flame-cut wind connections Apr. 30, 1931, p. 729
(Impact and static-bend tests fail to cause cracks on flame-cut edges. Planing edges after flame-cutting unnecessary.)
- Steel Determines heat distribution in torch-cut structural steel July 16, 1931, p. 39
(Only mild heat stresses are generated when preheating flame is run over line of cut.)
- Gas Engineer (London) .. Town gas for fusion metal cutting July 1931, p. 433-5
(Cutting machine for fashioning articles direct from the ingot—derrick rings (14 in. thick) crankshafts, cross heads connecting rods, etc.)
- Gas Age-Record .. Scrapping steel ships with city gas..... June 13, 1931, p. 901
(Mfd. gas cutting speed equal to that for acetylene, oxygen consumption same.)
- Wearing in Motors—A-XIII*
- Industrial Gas .. Block testing automobiles .. May 1931, p. 7
(Speed, power and gas consumption curves mfd. gas.)
- Miscellaneous—A-XIV*
- Industrial Gas .. Solving combustion problems in the lime industry July 1931, p. 11
(Producing quicklime with natural gas—small scale operation.)
- Combustion ... Natural gas for industrial boiler plants..... Aug. 1931, p. 39
(Economics of natural gas, description of installations.)

- Das Gas und Wasserfach .. Miscellaneous industrial data June 6, 1931, p. 538
(On German long-distance coke oven gas transmission system.)
- Heating & Ventilating .. Space heating with gas..... Sept. 1929, p. 68
(Comparative costs—unit heaters vs. steam plant for industrial plant.)
- Heating & Ventilating .. Industrial building heating with gas..... Dec. 1930, p. 98
(Description of unit heaters—method of estimating consumption.)
- Case Hardening—B-V*
- Heat Treating & Forging ... Manufactured gas as a fuel in heat treatment furnaces June 1931, p. 603
(Data on carburizing.)
- Industrial Steam Applications—E*
- Combustion ... Natural gas as fuel in power plants July 1931, p. 21-31
(Combustion analyses, burners, operating charts.)
- Gas Age-Record .. Natural gas for industrial boiler plants..... June 27, 1931, p. 987
(Competitive prices—methods of installing conversion burners.)
- Western Gas ... Converting the laundry to natural gas..... July 1931, p. 28, 58
(Laundry boiler problems, selling points for gas.)
- Vitreous Enameling—J-III*
- Jl. of the Amer. Ceramic Soc. .. Power cost on an electric enameling furnace..... July 1931, p. 499-501
(Consumption for heavy and light loads wet process enamels on cast iron.)
- Electrical World Economic operation of electric enameling furnace... June 20, 1931
(Elec. consumption for misc. iron ware—effect of weight of support bars on over-all economy.)
- Heat Treating & Forging Gas cuts cost of fusing enamel to metal..... Mar. 1931, p. 289
(Cost comparison gas vs. coal furnace.)

Sets Construction Record

A NEW record of rapid construction was made by crews of the Oklahoma Natural Gas Corporation, which completed nearly three weeks ahead of schedule construction of nearly 120 miles of steel gas pipe line in Texas for the West Coast Power Company. Eighteen miles of the line run through rock and other sections run through soils where

bad corrosive elements were encountered.

The new line consists of 77.1 miles of 12-inch pipe east from Big Lake, in the Texon oil field to San Angelo, Texas, and 42.72 miles of 8-inch line west from the Texon field to the Pecos Valley power plant near Girvin, Texas. R. W. Hendee, Tulsa, Okla., vice-president, Oklahoma Natural Gas Corporation, was in charge of the Texas construction.

"How to Freeze"

MRS. LUELLA M. FISHER, in charge of home service for the Iroquois Gas Corporation, broadcast an address recently from WBEN at Buffalo (N. Y.). Her subject was "How to Freeze."

In the course of the broadcast Mrs. Fisher detailed various recipes for frozen desserts and home-made ice cream and how easily these could be made with a gas refrigerator.

Accounting Section

J. I. BLANCHFIELD, Chairman

H. W. HARTMAN, Secretary

WILLIAM A. DOERING, Vice-Chairman

To Describe Accounting Systems at A. G. A. Convention

THE Accounting Section Committee on Development of Mechanical Office Equipment, Herbert E. Cliff, Public Service Electric and Gas Company, chairman, is completing plans for a one-day open meeting on customers' accounting which will be held on Monday, October 12, in the Convention Hall at Atlantic City in connection with the Thirteenth Annual Convention of the American Gas Association.

It is the purpose of the meeting to present to the accountants of the industry a cross-section of the most efficient customers' accounting methods in use. In selecting the accounting systems to be presented, the committee was guided by the leading accounting machine companies in the customers' billing field. Each of the machine companies submitted to the committee the name of the utility company that best typified the methods sponsored by the machine company.

Representatives of the utility companies thus selected have prepared papers describing their systems for presentation at the meeting. In order to facilitate comparisons, all papers have been prepared following the same general outline. An effort will be made to have these papers

printed in report form and distributed to the members of the Accounting Section for detailed study in advance of the meeting so that those who attend the meeting may be prepared to enter into the discussion which will follow each paper.

Although final plans have not been made, the customers' accounting procedures of the following utility companies are expected to be described: Consolidated Gas Company of New York, New York City—Hollerith punched card plan; Cambridge Gas and Electric Company, Cambridge, Mass.—Remington Powers punched card plan; Laclede Gas Light Company, St. Louis, Mo.—Burrhoughs stub plan; Commonwealth Edison Company, Chicago, Ill.—Elliott Fisher register sheet plan; and Philadelphia Company, Pittsburgh, Pa.—Remington post card plan.

Last year's spirited meeting on the application of machines to general office accounting, sponsored by this committee, elicited much favorable comment from the members of the Accounting Section who desire to study in detail the merits of various machine accounting plans. This year's meeting is expected to prove equally as interesting and instructive.

16. In case a meter tested upon request is found to be fast by more than 2 per cent, or whenever a meter tested for any reason is found to be more than 5 per cent fast, the owning utility shall refund to the consumer, for a period of six months prior to the test for such time as the meter was in such consumer's service—not to exceed six months—the same percentage of the amount of his bills as the meter is shown to be in error.

17. In case a meter tested upon request is found to be slow by more than 2 per cent, or whenever a meter tested for any reason is found to be more than 5 per cent slow, the owning utility may collect from the served consumer, for a period of six months prior to the test or for such time as the meter was in such consumer's service—not to exceed six months—the same percentage of the amount of his bills.

22. At the time of making a required annual financial and statistical report, each gas utility shall present a summary of the year's records of heat content, purity, pressure conditions, meter testing, interruptions and complaints, showing therein the following:

1. Maximum B.t.u.
2. Minimum B.t.u.
3. Number of days when maximum exceeded monthly average.
4. Number of days when minimum equalled or was less than required minimum.
5. Number of days when hydrogen sulfide, total sulfur and/or ammonia exceeded the required limits.
6. Number of days when actual minimum consumer's pressure was below required minimum (not considering interruptions to service).
7. Number of days when actual maximum pressure exceeded the selected maximum.
8. Actual maximum pressure for year.
9. Maximum variation of pressure between 5 A.M. and 8 P.M. for year.
10. Days when actual maximum variation of pressure exceeded 100 per cent of minimum.
11. Maximum 15 minute period variation.
12. Number of days in year during which pressure varied more than permitted.
13. Number of meters tested.
14. Percentage of meters tested.
15. Number of tested meters found fast by 2 per cent or more.
16. Number of tested meters found slow by 2 per cent or more.
17. Summary of complaints.
18. Summary of interruptions and causes.

Vermont Prescribes Standards for Gas Utilities

EFFECTIVE September 1, 1931, the Vermont Public Service Commission has issued General Order No. 18, prescribing service standards for all gas utilities operating in that State.

Following are extracts from the requirements:

4. Each utility supplying manufactured gas shall maintain the monthly average heat content of such gas, at any point within one mile of the manufacturing plant, or at the center of distribution at a selected standard not less than 515 B.t.u. per cu.ft. The heat content at no time shall fall below the average monthly standard by more than 5 per cent. Where such gas is supplied to the mains under a pressure in excess of five (5) pounds per sq.in., such heat content standard shall apply to gas before compression. Each utility shall file as part of its rate schedule its B.t.u. selected standard.

8. In case any utility finds it impractical or uneconomical to manufacture gas with the required heat content, it may file with the Commission an application to change its selected standard, setting forth all pertinent facts, and thereafter the Commission may revise the heat content requirements for such utility.

14. No gas meter now or hereafter installed shall remain in service more than seven (7) years from the date of last test without a retest. Each utility shall annually test at least 14 per cent of its meters in service until this requirement is met.

15. Each utility shall cause any meter in service to be tested on request of the consumer served through such meter, provided that if such requests cause a meter to be tested within three years from date of last test, and if it is found to be accurate within two (2) per cent, then the cost of such test shall be paid by the requesting consumer.

Manufacturers' Section

E. S. DICKEY, Chairman C. W. BERGHORN, Secretary DAVID F. KAHN, Vice-Chairman W. E. STEINWEDELL, Vice-Chairman

List of Exhibitors at Next Convention Continues to Grow

MORE than 200 exhibitors whose products will be on display at the Thirteenth Annual Convention of the American Gas Association, at Atlantic City, N. J., next month had been assigned space by the Exhibition Committee on August 10, and the number was mounting steadily. Indications are that this year's exhibit will be one of the largest and most complete yet staged by the Association.

Following is a list of exhibitors as of August 15:

Name	Booths
A. G. A. Testing Laboratory.....	827
Allen Mfg. Co. Inc.....	717
A-B Stove Co.....	425
Adams Bros. Mfg. Co. Inc.....	210
Addressograph Co.....	616, 700
Air Reduction Sales Co.....	206
Alpha-Lux Co. Inc.....	228
Aluminate Co. Inc.....	116
American Cast Iron Pipe Co.....	110
American Foundry & Furnace Co.....	831
American Furnace Co.....	835
American Gas Furnace Co.....	410
American Gas Journal.....	629
American Gas Products Corp.....	527, 528
American Heater Corp.....	513, 514
American Lava Corp.....	732
American Meter Co.....	323, 4, 5; 404, 5, 6
Griffin & Co., John J.	
Helme & McIlhenny	
Maryland Meter Works	
McDonald & Co., D.	
Metric Metal Works	
Pacific Meter Works	
Tufts Meter Works, Nathaniel	
American Radiator Co.....	527, 28, 29, 30
American Rolling Mill Co.....	220
American Stove Co.....	522, 3, 4, 5, 6
Clark & Co. Div., Geo. M.	
Direct Action Stove Co. Div.	
New Process Stove Co. Div.	
Quick Meal Stove Co. Div.	
Reliable Stove Co. Div.	
American Thermometer Co.....	136
Andes Range & Furnace Corp.....	709
Arco Gas Appliance Corp.....	529, 30
Associated Gas & Electric System.....	301
Autogas Corp.....	147
Automatic Gas Steam Radiator Co.....	140
Bailey Meter Co.....	205
Barber Gas Burner Co.....	311

Name	Booths
Barber-Greene Co.....	15
Bartlett Hayward Co.....	604
Behringer Co., Edward A.....	619
Bingham & Taylor Corp.....	223
B-Line Boiler Co.....	332
Blodgett Co., G. S.....	316
Bristol Co.....	828
Brown Instrument Co.....	100, 101
Bryant Heater & Mfg. Co.....	430, 431
Burdett Mfg. Co.....	811
Burroughs Adding Machine Co.....	5, 6; 9, 10
Carrier-Lyle Corp.....	626; 710
Central Foundry Co.....	705
Chace Valve Co., W. M.....	716
Chambers Mfg. Co.....	240
Chaplin-Fulton Mfg. Co.....	319
Chapman Valve Mfg. Co.....	224
Chicago Bridge & Iron Works.....	226
Cleveland Co-Operative Stove Co.....	612
Cleveland Heater Co.....	308, 9, 10
Cleveland Trencher Co.....	601, 602
Clow & Sons, James B.....	213
Connelly Iron Sponge & Governor Co.....	108
Continental Stove Co.....	731
Crane Co. 720, 1, 2, 3, 4, 5; 801, 2, 3, 4, 5, 6	
Cribben & Sexton Co.....	614, 615
Crown Stove-Works.....	137
Cruse-Kemper Co.....	829A
Cutler-Hammer, Inc.....	503
Dearborn Chemical Co.....	518
Detroit-Michigan Stove Co. 606, 7, 8, 9, 10	
Dresser Mfg. Co., S. R.....	401, 402
Dun-Rite Clock Device Co.....	313
Economy Governor Co.....	621
Electrolux Refrigerator Sales, Inc.....	Stage
Elliott Addressing Machine Co.....	800
Estate Stove Co.....	428, 9; 511, 12
EverHot Heater Co.....	707
Favorite Stove & Range Co.....	832
Felt & Tarrant.....	719
Fisher Governor Co. Inc.....	701
Florence Stove Co.....	809
Floyd-Wells Co.....	807
Forrest City Foundries Co.....	119
Foxboro Co. Inc.....	703, 704
Fox Furnace Co.....	531
Gas & Electric Heater Co.....	613
Gas Machinery Co.....	306
Gas Purifying Materials Co.....	620
General Ceramics Co.....	118
General Coal Co.....	103
General Gas Light Co.....	726, 7, 8, 9

Name	Booths
Giant Mfg. Co.....	204
Gifford-Wood Co.....	202
Glenwood Range Co.....	633, 34
Globe American Corp.....	231
Griswold Co., W. A.....	328
Groble Gas Regulator Co.....	420
Guardian Gas Appliance Co.....	211
Gwathmey Mfg. Co.....	217
Handley Brown Heater Co.....	120
Harper-Wyman Mfg. Co.....	631
Heating & Ventilating.....	142
Hoffman Heater Co.....	317, 318
Homestead Heater Co.....	111
Hones Co. Inc., Chas. A.....	715
Hotstream Heater Co.....	230
Hubbard Oven Co.....	834
Improved Equipment-Russell Engineering Corp.....	200
Inertol Co.....	203
International Business Machines Corp. 1-B	
Isbell-Porter Co.....	829B
Jackson Engineering Corp.....	107
Johns-Manville, Inc.....	836, 837
Judelson Dryer Corp.....	239
Kellogg Mann Co., Inc.....	808
Kelly, Inc., John G.....	314
Kernit Incinerator Co.....	312
Kitson Co.....	838
Kompak Co.....	327
Koppers Construction Co.....	605
Lambert Meter Co.....	322
Lattimer Stevens Co.....	222
Lavino & Co., E. J.....	519
Lawson Mfg. Co.....	219
Linde Air Products Co.....	133
Littleford Bros.....	419
Lovekin Water Heater Co.....	623, 624
Majestic Mfg. Co.....	117
McWane Cast Iron Pipe Co.....	225
Mears-Kane-Ofeldt, Inc.....	416
Merco Nordstrom Valve Co.....	830
Mettler Co., Lee B.....	221
Milwaukee Gas Specialty Co.....	427
Mine Safety Appliances Co.....	207
Minneapolis-Honeywell Regulator Co.....	413, 414
Mitchell Specialty Co.....	236
Mohawk Asphalt Heater Co.....	706
Moore Brothers Co.....	627
Mueller Co.....	320

Name	Booths
Mueller Furnace Co., L. J.....	326
Mulcare Engineering Co.....	622
National Equipment Co.....	128, 29, 30
National Tube Co.....	302, 3, 4
Natural Gas Magazine.....	628
Neldner Valves Co.....	814

Ohio Foundry & Mfg. Co.....	214
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Partlow Corp.....	718
Patrol Valve Co.....	232
Peerless Heater Co.....	711
Peerless Mfg. Co.....	233
Pennsylvania Furnace & Iron Co.....	415
Perco-Steril Machine Corp.....	238
Permutit Co.....	201
Petroleum Heat & Power Co.....	632
Phillfuels Co.....	16, 17
Pittsburgh Coal Co.....	517
Pittsburgh-Des Moines Steel Co.....	618
Pittsburgh Equitable Meter Co.....	227; 305
Pittsburgh Incinerator Co.....	810
Pittsburg Water Heater Co.....	508, 9, 10
Public Utilities Reports, Inc.....	132

Ray-Glo Corp.....	714
Remington Rand, Inc. 2, 3, 4; 11, 12, 13	
Republic Flow Meters Co.....	106
Republic Steel Co.....	113, 14, 15
Reynolds Gas Regulator Co.....	417, 418
Robbins & Myer Co.....	712
Robbins Publishing Co.....	500
Roberts & Mander Stove Co.....	331; 412
Roberts Brass Mfg. Co.....	611
Roberts-Gordon Appliance Corp.....	229
Robertshaw Thermostat Co.....	234, 235
Roots-Connersville-Wilbraham, Div.....	505
Roper Corp., Geo. D.....	432; 515
Rudy Furnace Co.....	625
Ruud Manufacturing Co.....	407, 8, 9
Ryan, Scully & Co.....	736

Safety Gas Lighter Co.....	139
Safety Gas Main Stopper Co.....	135
Sands Mfg. Co.....	426
Savory, Inc.....	737
Selas Co.....	730
Semet-Solvay Engineering Corp.....	321
Sheer Co., H. M.....	733
Simplex Gas Products Co.....	708
Skinner Co., M. B.....	129
Slattery & Bro. Inc., J. B.....	237
Smith Corp., A. O.....	520, 521
Smith Mfg. Co., A. P.....	126
Sommerville Stove Works.....	121
Spencer Thermostat Co.....	215, 216
Sprague Meter Co.....	502
Stacey Bros. Gas Construction Co.....	504
Stacey Mfg. Co.....	400
Standard Gas Equipment Corp.....	423, 4; 506, 7
Stanwood Corp.....	833
Stat-Amatic Instrument & Appliance Co.....	735
Superior Meter Co.....	300
Surface Combustion Co.....	333, 34, 35

Tappan Stove Co.....	329, 330
Therminsul Corp.....	122
Tinnerman Stove & Range Co.....	212

Underwood Elliott Fisher Co.....	516, 600
United Engineers & Constructors, Inc.....	421, 422
United States Bureau of Mines.....	104, 105
United States Pipe & Foundry Co.....	501
Universal Sand Equipment Co.....	208, 209

Victaulic Co. of America.....	617
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Wailes Dove-Hermiston Corp.....	14
Walker & Pratt Mfg. Co.....	411
Watts Regulator Co.....	315
Welsbach Co.....	112
Western Gas Construction Co.....	603
Western Steel Products Corp.....	713
West Gas Improvement Co.....	702
Wilcolator Co.....	307
Wood & Co., R. D.....	403
Wood Mfg. Co., John.....	817, 818

Youngstown Pressed Steel Co.....	630
Youngstown Sheet & Tube Co.....	134

New Members

FOLLOWING are new manufacturer company members:

Gwathmey Mfg. Co., J. H. Gwathmey, Pres., Harrisonville, Missouri. Conversion burners.

Hollywood Water Heater Co., Geo. Kite, Jr., Pres., Glendale, Calif. Water heaters. Neldner Valves Corp., J. J. Bloomer, Secy. Milwaukee, Wis.

Empire Gas Burner Co., A. Fugere, Pres., Easthampton, Mass. Conversion burners.

American Furnace Co., C. S. Franke, Secy. & Treas., St. Louis, Missouri. House heating furnaces.

Johnston Gas Furnace Corp. Ltd., P. Johnston, Pres., Los Angeles, Calif. House heating furnaces.

Pacific Pipe & Supply Co., A. T. Gray, Mgr. Papico Htr. Dept., Los Angeles, Calif. Gas heating equipment.

Mascot Stove Mfg. Co., O. T. Tindell, Jr., Pres., Chattanooga, Tenn. Gas ranges & appliances.

Leonard & Baker Stove Co., A. W. Tallman, Vice-Pres., Taunton, Mass. Gas ranges & appliances.

Kellogg Mann & Co. Inc., H. M. Kinnee, Pres., Buffalo, N. Y. Gas-fired incinerators.

Meadows Mfg. Co., C. K. Woodin, Asst. Gen. Mgr., Bloomington, Ill. Clothes ironers & press ironers.

Wm. S. Harman, Owner, Columbus, Ohio. Producer of coal.

The Stanwood Corp., W. E. Teklenburg, Mgr. Gas Htg. Div., Cincinnati, Ohio. Unit heaters & warm air furnaces.

Service Records Exceed 80,000 Years

THE total service records of the 9,000 employees of the Consolidated Gas Company of New York and affiliated gas companies exceed 80,000 years, according to a recent estimate.

The company has a total of 9,282 employees, of whom 4,178, or 51 per cent, have served five years or more, and 4,564, or 49 per cent, have served less than five years.

Five employees have served the company continuously for more than 50 years, and one employee has a record of 61 years. More than 500 employees have served 25 years or more.

E. R. Curtin Heads West Ohio Gas Company

Emmett R. Curtin was elected president of the West Ohio Gas Company at a meeting of the board of directors held today. He succeeds his father, E. R. Curtin, who died on June 7.

Frank L. Pringle was elected comptroller of the company. O. L. Smith was elected assistant treasurer and assistant secretary, posts formerly held by Mr. Pringle.

Samuel Insull, Jr., was elected chairman of the company and Robert M. Feustel, vice chairman of the company. William A. Sauer was elected vice-president and G. Corson Ellis, assistant to the chairman of the company.

Mr. Feustel was elected a member of the board of directors to fill the vacancy caused by the death of Mr. Curtin.

Edgar Guest



Poet philosopher to address manufacturers at Detroit meeting

Monthly Summary of Gas Company Statistics

FOR MONTH OF JUNE, 1931

Issued August, 1931, by the Statistical Department of the American Gas Association
420 Lexington Avenue, New York, N. Y.

PAUL RYAN, Statistician

DURING the first six months, revenues of manufactured and natural gas utilities declined 3.7 per cent, while gas sales dropped 7.1 per cent, as compared with the first half of 1930, according to reports to the Statistical Department from companies serving 13,659,000 customers and comprising nearly 90 per cent of the gas utility industry.

Revenues of reporting manufactured gas companies aggregated \$198,702,000 during the first half year, a decline of 1.9 per cent, while sales totalled 188,243,000,000 cu.ft., a drop of 1.6 per cent. During the first

quarter, these companies reported a decline of 1.7 per cent in revenues and 1.3 per cent in sales.

Natural gas utilities reported aggregate revenues of \$160,798,000 during the first six months, a drop of 5.9 per cent, and total sales of 370,980,000,000 cu.ft., a decrease of 9.7 per cent. In the first quarter natural gas revenues were down 6.3 per cent and natural gas sales 10.9 per cent when compared with the corresponding period of 1930.

A considerable drop in manufactured gas

sales occurred in the East North Central states, embracing the industrial region of the Middle West, and on the Pacific Coast. In both of these areas sales during the first six months declined 7 per cent. In contrast, manufactured gas sales in the New England and South Atlantic states registered increases of 2.5 per cent and 4.7 per cent, respectively, during the same period.

Natural gas sales declined sharply in several states of the Mid-Continent and Southwestern area, while sales in California dropped only 3.4 per cent.

COMPARATIVE STATISTICS OF 167 MANUFACTURED GAS COMPANIES FOR THE MONTH OF JUNE, 1931

	Month of June			Six Months Ending June 30		
	1931	1930	Per cent Increase	1931	1930	Per cent Increase
Customers	9,073,582	9,012,408	0.7	See June		
Gas Sales (MCF)	28,797,618	29,703,380	— 3.1	188,243,264	191,323,124	— 1.6
Revenue (Dollars)	31,245,831	32,173,180	— 2.9	198,702,189	202,515,987	— 1.9
Gas Produced and Purchased (MCF)						
Gas Produced						
(a) Water Gas	12,483,315	12,618,619	— 1.1	94,445,717	97,766,357	— 3.4
(b) Retort Coal Gas	2,461,375	2,498,542	— 1.5	16,032,530	16,067,627	— 0.2
(c) Oil Gas	507,238	539,256	— 5.9	4,050,204	4,391,104	— 7.8
(d) Coke Oven Gas	4,343,505	4,001,637	8.5	26,050,287	24,193,273	7.7
(e) Reformed Oil Still Gas	351,507	130,921	—	2,193,462	871,362	—
(f) Total Gas Produced	20,146,940	19,788,975	1.8	142,774,200	143,289,723	— 0.4
Gas Purchased						
(a) Coke Oven Gas	8,250,529	9,058,137	— 8.9	55,619,370	57,977,863	— 4.1
(b) Oil Still and Natural Gas	412,569	244,768	68.5	2,284,272	1,763,444	29.5
(c) Total Gas Purchased	8,663,098	9,302,905	— 6.9	57,903,642	59,741,307	— 3.1
Total Gas Produced and Purchased	28,810,038	29,091,880	— 1.0	200,677,842	203,031,030	— 1.2

COMPARATIVE STATISTICS OF 155 NATURAL GAS COMPANIES FOR THE MONTH OF JUNE, 1931

Customers						
Domestic (Including House Heating)	4,358,867	4,314,789	1.0	<i>See June</i>		
Commercial	204,036	189,151	7.9			
Industrial	14,959	14,985	— 0.2			
Main Line Industrial	5,393	6,245	—13.6			
Miscellaneous	2,413	1,297	—			
Total	4,585,668	4,526,467	1.3			
Gas Sales (MCF)						
Domestic (Including House Heating)	16,064,332	16,285,538	— 1.4	172,830,505	175,977,122	— 1.8
Commercial	2,103,143	2,059,095	— 2.1	25,619,120	23,568,952	8.7
Industrial	15,625,816	18,874,576	—17.2	99,932,950	117,372,723	—14.9
Main Line Industrial	11,225,203	12,046,578	— 6.8	68,945,881	89,358,209	—22.8
Miscellaneous	585,233	714,015	—	3,651,985	4,587,445	—
Total	45,603,727	49,979,802	— 8.8	370,980,441	410,864,451	— 9.7
Revenue (Dollars)						
Domestic (Including House Heating)	11,852,649	12,113,838	— 2.2	115,603,230	117,464,389	— 1.6
Commercial	1,133,214	1,164,663	— 2.7	12,418,057	11,975,411	3.7
Industrial	3,489,238	4,519,171	—22.8	23,554,175	29,205,315	—19.3
Main Line Industrial	1,406,011	1,577,526	—10.9	8,645,922	11,186,750	—22.7
Miscellaneous	71,424	151,731	—	577,034	1,026,084	—
Total	17,952,536	19,526,929	— 8.1	160,798,418	170,857,949	— 5.9

Associations Affiliated with A. G. A.

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Sec.-Tr.—G. W. Allen, 21 Astley Avenue, Toronto.

Empire State Gas and Electric Association

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Thirteenth Annual Convention of the American Gas Association
Atlantic City, N. J. - - - October 12-16, 1931

Personnel Service

SERVICES OFFERED

Commercial manager with a record in the electric as well as the gas industry wishes a new connection in which to demonstrate his sales ability. Broad experience and a record of accomplishment in the appliance manufacturing as well as the utility field. Versed in sales research, budget control, surveys, reports, etc. Also publicity and gas engineering. Now located in the east. 425.

Chemist, experienced in the preparation of reports, cost estimates, market surveys and in patent and literature searches. University graduate, M.S. (33); ten years' research experience in gas and oil fields. 429.

Engineer-manager with technical education and eighteen years of service in all branches of the gas industry, both manufactured and natural, including public utilities commissions, desires position with considerable responsibility requiring executive ability, technical training and practical experience. 430.

Gas boiler salesman and engineer with manufacturer or gas company. Twelve years' experience, sales-engineering all phases of gas boiler application and control work. Can figure radiation B.t.u. transmission method, lay out and supervise all types of heating and installation; good gas company and trade following. No objection to travelling. 432.

Industrial engineer (38) with technical and cadet education; twelve years' experience in application of natural and manufactured gas for industrial, commercial, power, large heating boilers and house heating purposes. Experience includes industrial surveys, sales, equipment design, installation and adjustment; interested in new connection with gas company or appliance manufacturer. 433.

Engineer-accountant, experienced in public utility, general accounting, municipal, state and federal tax procedure. Background includes federal service and state regulatory work in capitalization appraisal and valuation. Thoroughly familiar with modern rate structures and preparation of rate case material and exhibits. 437.

My record of results as an owner of three plants (coal and c.w.g.) makes me available to those desiring a first-class manager. Have lately disposed of last property and am open for an opportunity in any location. 440.

Gas engineer (B.S. and M.E.) with thirteen years' diversified experience in coal and water gas production, distribution and plant erection followed by eight years in plant design, economic surveys and utility appraisals. Strong background of research work and experience as instructor. 441.

Research chemist, university graduate, M.S. (33). Ten years' government and industrial research experience in gas and related fields. Plant testing, experimental plant operation, and the development of new products. Gas purification, bituminous coatings, coal tar refining, high-pressure hydrogenation, and other problems. 442.

Civil engineer, experienced in design, construction and operation of natural gas pipe lines, compressor stations, and town distribution plants, and who has in addition to the above experience a thorough training in purchasing and executive work. Would like to make a connection as gas engineer or district manager of a natural gas company. 443.

Superintendent, assistant or general foreman with over twenty-five years' experience in coal and water gas manufacture and general plant maintenance. Applicant willing to go anywhere and will guarantee good results. 444.

Manager and engineer, technically sound, well educated with unusually varied experience of twenty years; thorough understanding of economics of different processes including reforming of natural gas and oil-gas, by-product utilization, raw materials and unit costs. Accustomed to planning

SERVICES OFFERED

and carrying out improvements and making high- and low-pressure distribution layouts. 445.

Sales manager-engineer. Ten years with leading gas construction company and eight years with general contracting companies, desires new connections. Located in New York City. Will go anywhere. Married. Not afraid to work. 446.

Manager with twenty-three years' experience in all phases of manufactured gas business desires position as manager of small property or assistant to manager of large property. Will consider position to take charge of Operation or Construction Department. 447.

Industrial engineer and furnace designer, ten years' experience with all types of gas operated industrial furnaces, including estimating and erection; technical graduate. No objection to travelling. 448.

Industrial and natural gas engineer (33), technical graduate, ten years' practical experience in production, geology, industrial natural gas sales, utilization, and market surveys. Can obtain results in competitive industrial applications and promote company-customer good will. Desires connection where wide range of experience will be of mutual benefit. 449.

Commercial manager (32) married. University graduate. Ten years' experience with both gas and electric properties. Now employed with large middle-west company. 450.

Manager of gas property, twenty years' manufacturing experience in coal, water, and natural gas distribution, high and low pressure. Have excellent record as a merchandiser. 451.

Gas sales engineer (35), engineering graduate, desires executive, engineering, or sales position. Eight years' experience in operating, rate, house heating, and industrial gas departments with company having 45,000 meters. Capable of taking charge of industrial gas and house heating department. Extensive rate experience. 452.

Gas range salesman with a clean record. Eight years with last employers. Have large acquaintance with utility and department store merchandisers in the middle-west states. Will consider a connection with a live and progressive manufacturer. 453.

Gas manager of thirty years' experience in small properties wishes to transfer to a similar position. He is a practical man, familiar with production and distribution, and has had experience also in the construction and operation of butane plants. 454.

Salesman, American, (29). Excellent selling record. Keen merchandiser. Ten years' experience radio and electric appliances. Wide jobber, dealer and industrial contacts in East. Close personal contacts with executives, department and chain stores and public utilities. 455.

Manufacturers' representative in the Chicago district desires an additional non-conflicting line. Thoroughly established. Prefers foundry, furnace or heating equipment. 456.

Sales or assistant manager. Fourteen years' experience as general manager of public utilities including gas, electric, water and ice. Especially familiar with sales promotion, rate work, public relations and accounting. 457.

Staff accountant, experienced in cost and rate analyses, preparation of rate schedules, statistics and special accounting and economic studies of utility operation, desires position in similar work. Twelve years' experience. Age 32, single. No objection to travelling or location. 458.

Utility sales manager with a number of years' experience with gas companies in the East and mid-west would like to connect with a manufacturer of high-grade gas appliances with a view to introducing the product among utilities, where he has an extensive acquaintance and thorough knowledge of the business. 459.

POSITIONS OPEN

Manufacturer's representatives wanted to contact utilities with high-grade line of automatic storage gas water heaters and conversion burners now being marketed by one of the country's foremost heater manufacturers. Company now making sales arrangements for entire country. Some very desirable territories still available. Straight commission arrangement. 0217.

Manufacturer of gas ranges and appliances with national distribution, one of the leaders in its field, has place for several keen, aggressive utility salesmen with proven sales ability and successful sales records willing to invest some time working in a junior capacity with possibilities for advancement. Interview determined upon complete information regarding ability and record. Positions available are in the East. 0219.

Manufacturer's representatives wanted for San Francisco, St. Louis, Birmingham, Detroit, Cleveland, Buffalo, and New York to handle a complete and well-known line of automatic combustion and gas pressure control equipment. Sales previously handled direct from factory. Applicants must be familiar with fuel and combustion engineering problems as encountered in gas plants, coke plants, steel plants and steam plants. 0220.

Salesmen—Investigate this. Are you an appliance salesman who can consistently produce each month? If so, here is our proposition. Salary \$85 per month on first \$500 worth of business; 8% commission on second \$500; and 15% on all over \$1,000 in any calendar month. If you are a producer, write today. 0221.

Industrial engineer by a large utility company completing a pipe line project, to sell gas to industrial companies and to utility companies along the line. Must be of high class type; give details of past work and state salary expected. 0222.

Gas range superintendent wanted for modern Eastern gas range plant. Must be capable of taking complete charge of production and enameling. Good opportunity for thoroughly experienced executive. State qualifications fully. Information will be held strictly confidential. 0223.

SERVICE FOR THE COMPANY EXECUTIVE

Whether you direct the affairs of a manufacturing gas company, a natural gas system, a holding group, manufacture or sell production or utilization equipment, A. G. A. Personnel Service stands ready to serve, prepared to furnish names, qualifications and experience of competent workers in all ranks, concisely abstracted from detailed and confidential classification records. Attention is further invited to the advertising facilities offered, under a private key number, whereby the Personnel Service functions as a confidential clearing house, the identity of the advertiser never being disclosed under any circumstances.

Letters of appreciation from both organizations and individuals, acknowledging services rendered, show that A. G. A. Personnel Service has regularly and satisfactorily secured the right man for the particular vacancy.

May we serve you too when you are next in the market for additional help?

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